

# The Ivories from the Shaft Graves at Mycenae

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## Abstract

*The Shaft Graves at Mycenae, discovered and excavated in 1876 by H. Schliemann (Grave Circle A) and in 1952-54 by J. Papadimitriou and G.E. Mylonas (Grave Circle B), contained the earliest known ivories from the Greek mainland (MH III-LH IIA). However, these finds have never been thoroughly examined, not even by J.-C. Poursat, who concerned himself closely with the development of Mycenaean ivory carving. Probably this is because of the ivories' mostly fragmentary character and the presence in these graves of more eye-catching objects of gold and other precious materials.*

*The article presents a catalogue and discussion of the ivories. Included are illustrations of two representations on pyxis fragments which are published here for the first time: a rearing quadruped by the sea, and the earliest depiction of a chariot on an ivory from the Aegean Bronze Age.*

*The conclusion is that at the time of the Shaft Graves a strong Cretan stimulus largely determined the use of ivory on the Greek mainland.*

## 1 PREFACE

Among the treasures from the Shaft Graves at Mycenae (MH III-early LH IIA) the ivories seem to occupy a modest place because their largely fragmentary condition makes it difficult truly to judge their merits.<sup>o</sup> Nevertheless, single ivories sometimes give a glimpse of the high level of craftsmanship which marks many other objects discovered in the Shaft Graves at Mycenae. Moreover, as these ivories are the earliest known specimens from mainland Greece<sup>1</sup> one inevitably becomes curious about the artisans who made them and their cultural background. The goal of this article is therefore to gain some clarity about the influences which contributed to the carving of the Shaft Grave ivories and, in turn, to add to our knowledge of earliest Mycenaean society and, more specifically, to that of the origins of the artistic repertoire as reflected in the finds from the Shaft Graves.<sup>2</sup>

## 2 CATALOGUE

The catalogue is arranged alphabetically according to object type and, then, numerically according to the numbers or the Greek letters of the Shaft Graves. Objects marked with \* have been examined by me in Athens. Dimensions are given in centimetres.

### Object types

A	attachment	Pi	pin
B	box, facing of	Pl	plaque

C	comb	Po	pommel
D	disc	Py	pyxis
Ha	handle	R	rosette
Hi	hilt	S	strips
N	needle	X	miscellaneous

Other abbreviation used: ANM = Athens National Archaeological Museum.

### A 1

Shaft Grave IV. ANM 507d.\* Attachment (?). Oblong shape with tapering ends. Rectangular central hole. Incised transverse grooves: three at each end, two on each side of the hole. L. 3.6; max. L. hole 0.9; W. hole 0.3. Bibl.: Karo 1930-1933, no. 507d, 213-214, pl. CI.

### B 1

Shaft Grave V. ANM 812. Wooden box with ivory and wooden inlays and appliqués. Also loose fragments.

The four preserved sides of the rectangular box are joined with pins. Two opposite sides are bordered lengthwise by glued, inlaid ivory squares. The two other sides are adorned with glued (?) appliqués: each side shows two diagonally superimposed ivory ledges on which a wooden dog figures, turned to the left; below, a wooden rectangle positioned upright. The ledges consist of two horizontal parts, of which the upper one is longest, widest and thickest, projecting at one end. The upper dogs are bigger, with one looking back; and unlike the lower dogs their tails hang. The loose fragments include remnants of wood, e.g. with inlaid ivory squares.

H. 11; W. 8; Th. wall 0.9-1.1. Ledges: L. 5.3; H. 1.7. Squares: W. 1.4-1.6; Th. 0.35.

Bibl.: Schweitzer 1930, 107-118, fig. 1, pl. XXIX; Karo 1930-33, no. 812, 245-246, 301, 319, pl. CXLV; Persson 1942, 179-181, fig. 131, 1; Kantor 1960, 15, fig. 1; Hooker 1967, 278; Vermeule 1975, 20, fig. 17; Poursat 1977a, no. 215, pl. XVIII; Poursat 1977 b, 20, 194, 253; Hood 1978, 115, fig. 100.

#### C 1 (figs. 1, 2)

Shaft Grave III. ANM 109.\*(Only the ivory fragments.) Comb; ivory fragments and strips of gold facing.

In cross-section the comb tapers downwards. The ivory frame, preserved as four pieces, is largely filled up with wax. Two pieces form part of an end which, in side view, has a bipartite form, rounded on top and bottom with a contraction at the halfway point. In the lower half there is the elongated surface of a break, probably from a handle. The other end of the frame is missing. In places the very tops of teeth remain. The gold strips, now kept separately, have somewhat slanting ends; originally the upper edge of each was folded back. In the middle of the top of the wide upper edge of strip *a* is a remnant of a probably circular projection. The decoration carved on either side of the ivory frame, in flattened relief with incised details, is preserved as an impression in the gold facing.

Representation *a*: a wavy line consisting of S-curves runs lengthwise across the strip and ter-

minates in a spiral at the outermost ends. A rosette is placed within each curve. At the point where the extremities of two S-curves meet there is a group of three pendent (top) or upright (bottom) leaves. Below the floral pattern, two horizontal bands.

Representation *b*: four quadrupeds lying (?) to the right. Two of them (far left and middle right) turn their heads back. The middle ones have spotted coats, with the spots running across the trunk in two horizontal rows. The hind legs, folded under the body, end in a spiral, either a claw or hoof. The forelegs are bent up. Two or three animals have a (plumed) tail (not the middle right one; far left, tail bent forward or filling ornament?). On the far right the tail is spotted. The surrounding space is largely filled with ornaments: on the top, a spiral (far left) and curved shading (middle left and far right). A horizontal band runs below the animal representation.

In addition, parallel incisions are visible on the end of the comb frame: four rows consisting of a number of short, curving lines, and two rows consisting of a few long, horizontal V-shaped markings. Comb frame: max. pres. W. 1.8; max. pres. Th. 0.8 (at the top)-c. 0.5 (below). Teeth: max. pres. L. 0.2. End fragment: max. W. 2.6; W. inside 2.2; max. L. 1.5; max. pres. Th. 1.0. Surface of elongated break: H. c. 1.2. Strip *a*: L. 12; W. 1.8; max. W. upper edge 0.5. Strip *b*: L. 12.3; W. 2.1 (edge included).

Bibl.: Karo 1930-33, no. 109, 187, 280, 298, 311, pls. XXXII, XXXIII; Sakellarakis 1979, 69, 113, fig. 95.

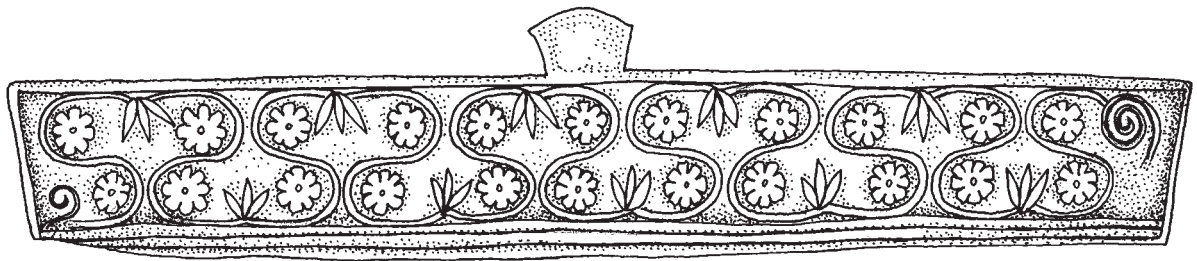


Fig. 1. C 1 (side a). Drawing Alma Reijling.



Fig. 2. C 1 (side b). Drawing Jan Velsink based on Karo 1930-33, pl. XXXII.

## C 2

Shaft Grave IV. ANM 310. Comb.

Semi-circular. Gold-plated frame. Teeth broken off.

Decoration burnt in: a zigzag of circles with central dots runs along three sides of the frame (below the gold plating and, in one spot, on the gold plating itself).

H. 2 (Karo)/ 1.8 (Poursat); W. 14.5 (Karo)/ c. 14.5 (Poursat); Th. 0.8.

Bibl.: Karo 1930-33, no. 310, 187, 350, pl. XLIII; Poursat 1977a, no. 211, pl. XVIII; Hood 1978, 122.

## C 3

Shaft Grave V. ANM 654. Comb.

The central section of the frame (preserved in pieces) is covered on both sides with a strip of gold plate, the upper edge of which is folded back. Above the middle of the upper edge the gold plate forms a crescent-shaped projection. The separate sidepieces, the ends of which are missing, are flat, curved and tapering. Apart from a corner tooth, only small remnants of teeth remain.

Strips: L. 14.2 or 14.3; W. 2 or 2.5.

Bibl.: Karo 1930-33, no. 654, fig. 45; Sakellarakis, 1979, 69, 113, fig. 94.

## C 4

Shaft Grave Γ. ANM 8702. Comb.

The separately fastened handle ends in a point and stands at a right angle to the actual comb. The upper contour of the comb frame is slightly concave. A number of teeth remain intact.

L. 9.7; W. 2.2; Th. 0.3.

Bibl.: Mylonas 1973, 78, no. 510, 349, pl. 62b; Poursat 1977a, no. 227, pl. XIX.

## C 5

Shaft Grave O. ANM (?). Comb (?); fragments.

Bibl.: Mylonas 1973, 189, 349.

## D 1 (fig. 3)

Shaft Grave Γ.

ANM 9664. Disc.

One round hole in the centre, fifteen along the edge at unequal distances from each other. One hole contains an ivory pin.

Max. D. c. 4; Th.

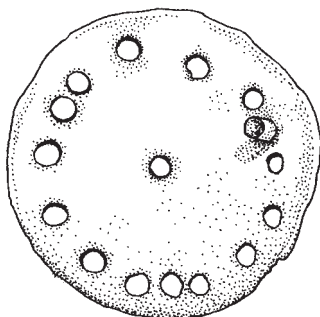


Fig. 3. D 1. Drawing Alma Reijling.

## 0.2.

Bibl.: Mylonas 1973, 79, no. 511, pl. 62c; Poursat 1977a, no. 230, pl. XIX.

## Ha 1

Shaft Grave II. ANM 216a. Bronze knife with ivory handle.

Curving, single-edged blade. The handle tapers away from the blade and has a knob-shaped extremity. The blade is inserted into a groove and kept in place by four bronze pins (three arranged triangularly near the blade, the fourth further away from the blade).

L. 21.6 (point missing); W. 2.4; Th. blade 0.5.

Bibl.: Karo 1930-33, no. 216a, 221-222, pl. LXXII; Tripathi 1988, 145, no. 662.

## Ha 2

Shaft Grave IV. ANM 422a. Bronze blade with ivory handle; fragment (little ivory remaining). Two pinholes, one containing a pin, are preserved. Incised minuscule dots around the pinholes.

L. 11.

Bibl.: Karo 1930-33, no. 422a, pl. XCVIII.

## Ha 3

Shaft Grave IV. ANM 422b.\* Bronze blade with ivory handle; fragment (small remnants of ivory remaining).

Two pins are preserved.

Bibl.: Karo 1930-33, no. 422b, pl. XCVIII.

## Ha 4 (fig. 4)

Shaft Grave IV. ANM 550b.\* Handle; fragment. Cylindrical, tapering at one end. Traces of bronze at other end. One side surface much splintered. Incised decoration: diagonal zones filled alternately with rows of lilies and rows of another kind of flower.

Pres. L. 6.0; ø at the top 1.75, ø below 1.25.

Bibl.: Karo 1930-33, no. 550b, 200, 247, 315, fig. 90; Poursat 1977a, no. 210; Poursat 1977b, 44, 108.



Fig. 4. Ha 4. Karo 1930-33, fig. 90.

*Ha 5 (fig. 5)*

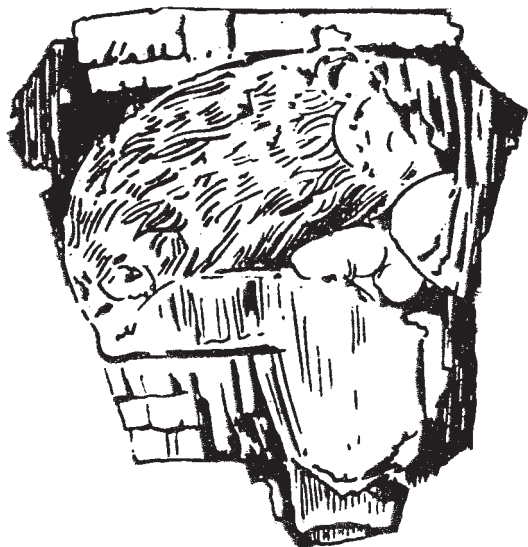
Shaft Grave V. ANM 785.\* Handle of mirror; fragment.

The handle was constructed of two horizontal plates and a shaft. A fragment of one plate remains, the other one is nearly completely missing, as is the shaft. The plates still hold part of the bronze mirror. A pinhole and part of the pin are preserved below the lion's head.

High-relief representation with incised details: remnants of a lying lion turned to the right (head, neck, foreleg?), bordered above by a double ledge, below by a triple one.

Max. H. 6.7; max. W. 6.6.

Bibl.: Karo 1930-33, no. 785, 247, 298, 314, 319, 340, pl. CXXXVI, figs. 58, 59; Schäfer 1958, 80-82, 87, fig. 5, pl. 60, 2; Poursat 1977a, no. 214, pl. XVIII; Poursat 1977b, 18-21, 68, 70, 72, 167, 180.



*Fig. 5. Ha 5. Schäfer 1958, fig. 5.*

*Ha 6*

Shaft Grave Δ. ANM 9567. Handle of knife (possibly no. 282 from the same grave).

The handle consists of two plates (now incomplete) which fit together and have an elongated, triangular shape. The pinholes are distinguishable: three close to the blade, arranged in a triangle, one closer to the middle of the handle.

Pres. L. 7.5; max. W. c. 3.

Bibl.: Mylonas 1973, 89, no. 512, pls. 71b, 72b; Poursat 1977a, no. 232, pl. XIX.

*Ha 7*

Shaft Grave I. ANM 8617.\* Bronze knife with rock

crystal pommel and traces of ivory handle.

Pres. L. 26.7.

Bibl.: Mylonas 1973, 118-119, no. 292, 419, pl. 100a, b.

*Hi 1*

Shaft Grave IV. ANM 396. Bronze dagger with ivory hilt.

The hilt consists of two plates, of which the lower end is curved (upper end partly broken off). Attached to the blade by means of four pins with gold-plated heads.

Decoration inlaid in the ivory: a pattern of gold spirals and rosettes (?), some of which are preserved between three pins; traces on the other side.

L. 26; W. 7.

Bibl.: Karo 1930-33, no. 396, 314, pls. LXXXIX-XC; Xenaki-Sakellariou 1988, 31, pl. 2.

*Hi 2*

Shaft Grave IV. ANM 397. Bronze dagger with fragment of ivory hilt.

The hilt consisted of two plates (one missing), ending below in a point and curving at the top (corner missing). Attached by means of three pins (one missing) with gold-plated heads.

Decoration inlaid in the ivory: a pattern of gold spirals.

L. 18.5 (point missing); W. 5.

Bibl.: Karo 1930-33, no. 397, pl. XC.

*Hi 3 (fig. 6)*

Shaft Grave IV. ANM 435. Bronze sword (type B) with ivory hilt.

The two ivory plates (one missing) were partially joined by a bronze plate, little of which survives. The preserved ivory plate was attached to the bronze by six pins with gold-plated heads. One of the pins and the end of the hilt are missing. Decoration inlaid in the ivory: a gold meander-like pattern of swastikas and diagonally hatched rectangles.

L. 55 (point missing); W. 7.3, at the top 2.6.

Bibl.: Karo 1930-33, no. 435, 204-205, 283, pls. LXXIII-LXXIV, LXXXVII; Hood 1978, 176, fig. 175c; Xenaki-Sakellariou 1988, 31, pl. 1b.

*Hi 4*

Shaft Grave V. ANM 737. Bronze dagger with remnants of ivory hilt.

Attached by means of three preserved pins.

L. 22.7; W. 4.1.

Bibl.: Karo 1930-33, no. 737, fig. 57; Dickinson 1977, 118, n. 17.



*Hi 5*

Shaft Grave VI. ANM 908.\* Alabaster dagger pommel with remnants of bronze and ivory belonging to the hilt.

H. 3; D. 5.2; ø hilt surface 2.5.

Bibl.: Karo 1930-33, no. 908.

*Hi 6*

Shaft Grave VI. ANM 927. Bronze dagger with ivory hilt.

The hilt is a slightly curved rectangular block with two concave sides. Attached by means of a bronze pin.

L. 26.7; W. 6 (including restoration).

Bibl.: Karo 1930-33, no. 927, pl. XCV.

*N 1*

Shaft Grave A. ANM 9579.\* Needle; fragment. Cylindrical. Upper end of shaft surrounded by eight incised rings. Lower part smooth. Below, shaft broken off at an angle. The rounded projections at the top must be remains of the eye.

Pres. L. 2.1; pres. L. shaft 1.7; shaft D. 0.45.

Bibl.: Mylonas 1973, 33, no. 507, pl. 22a.

*Pi 1*

Shaft Grave IV. ANM 507c.\* Pinhead (?)

Nearly spherical. A cylindrical shaft with a rounded cavity in the centre projects from the underside. In the cavity, six drill-holes (and an incomplete seventh one?); two opposite holes for a traverse pin in the wall.

H. 1.8; D. 2.4; cavity D. 1.0.

Bibl.: Karo 1930-33, no. 507c, 186, pl. CI.

*Pi 2*

Shaft Grave A. ANM 9579.\* Pin (?); fragment. Cylindrical. Three horizontal incisions around upper end.

Pres. L. 2.7; head D. 0.6.

Bibl.: Mylonas 1973, 33, no. 507, pl. 22a.

*Pl 1*

Shaft Grave V. ANM 835-837, 841. Fragments of plaques with pinholes.

Six pieces (two drilled), four pieces (three drilled; remnants of oxidized bronze assignable), part of a rectangular plaque (two transverse grooves near preserved end; pres. L. 8), and small shapeless lumps.

Bibl.: Karo 1930-33, nos. 835-837, 841; Poursat 1977a, no. 221.

*Pl 2*

Shaft Grave V. ANM 893. Five D plaques.

More or less rectangular, for the greater part with tapering long sides. Topside arching, underside flat. L. 1.3-1.9; W. 0.8-1.1; Th. 0.4-0.6.

Bibl.: Karo 1930-33, no. 893, pl. LXXI.

*Pl 3*

Shaft Grave A. ANM 8560, 9579. \*(Only ANM 9579.) Six plaques (four fragmentary).

Four almond-shaped (probably two with six round holes, and two with four), and two rectangular in shape (each with at least three round holes).

Max. L. 5.2 (pres. L. ANM 9579: 3.2); W. 1.5 (ANM 9579: 1.9); average Th. 0.7.

Bibl.: Mylonas 1973, 32, nos. 500-501b, 503, pl. 22a, b; Poursat 1977a, no. 225, pl. XIX.

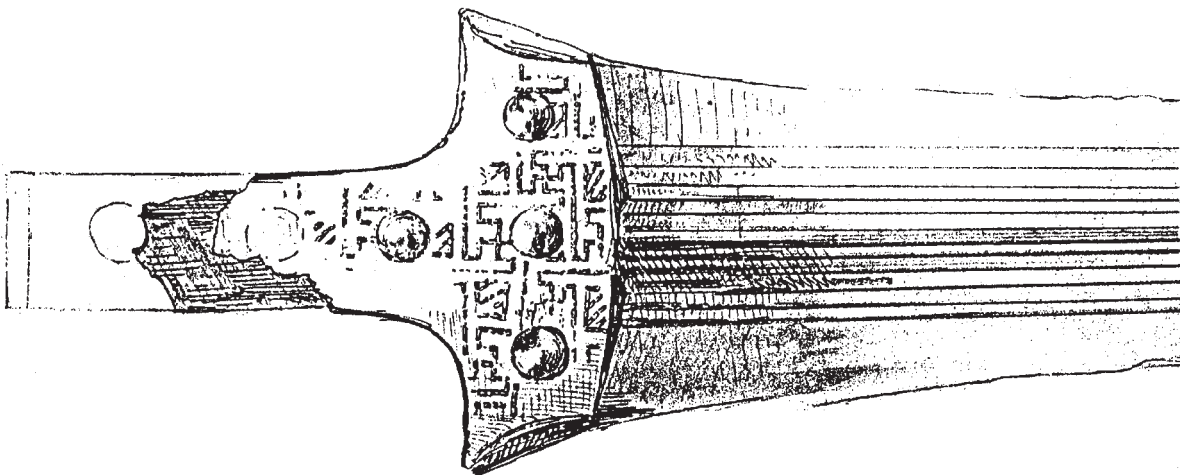


Fig. 6. Hi 3. Karo 1930-33, pl. LXXXVII (r.).

*Pl 4*

Shaft Grave Γ. ANM 9631. Two fragments of plaques.

Containing complete and partial holes.

Bibl.: Mylonas 1973, 79, no. 511, pl. 62c.

*Pl 5*

Shaft Grave O. ANM 9570.\* Plaque; 62 fragments. Originally rectangular.

Decoration: paired wavy lines in low relief creating pattern of void triangles with curving sides. On back, incised diamond pattern.

Estimated L. 7.5 (Mylonas); pres. W. 4.35; estimated W. 4.5 (Mylonas)/c. 5 (Poursat).

Bibl.: Mylonas 1973, 207, no. 520, pl. 188; Poursat 1977a, no. 237, pl. XIX.

*Po 1 (fig. 7)*

Shaft Grave IV. ANM 295b. Sword pommel.

The pommel, consisting of three rejoined fragments, is a cap of more than hemispherical form, slightly steepened on the side, flatter on top. Underneath, two curving heads of a bronze attachment pin stand opposite each other inside a round hole.

There is also a pinhole between two lions' heads. Representation in flat relief, with incised details: four lions running to the left. In a pinwheel arrangement their heads, seen from above, face oppositely on the top of the pommel, and their bodies, depicted from the side, curve and fan out below.



Fig. 7. *Po 1*. Poursat 1977a, figure on pl. XVII.

H. 6 (Karo)/ 6.3 (Poursat); max. D. 7.1; lower D. 5.5; hole D. 2; circumference 19.2.

Bibl.: Karo 1930-33, no. 295b, 203-204, 296-297, 314, 319, pls. LXXV-LXXVII; Vermeule 1975, 40-41; Poursat 1977a, no. 208, pl. XVII; Poursat 1977b, 35, 68, 70, 72-74, 90, 180, 183, 188, 195, 199, 201, 207-208, 226-227, 236, 244; Younger 1984, 47-48.

*Po 2*

Shaft Grave IV. ANM 550a.\* Pommel; fragment. Hole for a traverse pin.

Incised decoration: pattern (?) of groups of parallel wavy lines defining void triangles with curving sides.

Pres. H. 3.9; pres. D. 4.2; max. Th. fragment 0.7; pinhole D. 0.6.

Bibl.: Karo 1930-33, no. 550a, 203, n. 3.

*Po 3-12*

Shaft Graves IV-VI. ANM 490, 775-777, 834, 837, 936, 937. \*(Po 12/ ANM 937 only.) Pommels and pommel fragments from swords and daggers. Bibl.: Karo 1930-33, nos. 490, 775-777, 834, 837, 936; p. 203, fig. 57, pl. LXXVI; Poursat 1977a, nos. 212, 216-220, 223.

*Po 13-25*

Shaft Graves Γ, Δ, Z, I, Λ, N, O. ANM 8666, 8710, 9185-9187, 9561, 9571, 9584, 9600, 9606, 9654. Pommels and pommel fragments from swords and daggers.

Bibl.: Mylonas 1973, 78-79, nos. 508-509, 85-86, no. 277, 105, no. 513, 118, no. 514, 139, no. 516, 207, no. 521, pls. 61b, 67a, 68a, 99b, 121c, 189a; Poursat 1977a, nos. 228-229, 231, 233-236, 238, 241.

The provenance of ANM 9561 is not precisely indicated.

*Py 1*

Shaft Grave I. ANM 210.\* Pyxis; joining fragments belonging to the lowest part of the side. Three attachment holes.

Incised representation, from right to left: a sea, changing from calm (zigzags) to agitated (running spirals); the lowest part of a curving form narrowing downwards; a spiral seemingly changing into a tapering indented shape with a hatched ellipse inside; on the top left parts of curving lines and vertical zigzags. Below, four horizontal lines to the right (1) and the left of centre (3).

Pres. H. 2.65; pres. W. 12.7; Th. below 0.38; Th. at the top 0.3; estimated pyxis D. 10.1.

Bibl.: Karo 1930-33, no. 210, 277 (n. 2), 319, pl. CL; Poursat 1977a, no. 206a, pl. XVIII.

*Py 2 (fig. 8)*

Shaft Grave I. ANM 210.\* Pyxis; fragment belonging to the lowest part of the side.

Attachment hole slightly above the lower edge. Surface strongly worn, partly splintered.

Incised representation (incomplete): rearing quadruped turned to the left, with spotted coat (rows of tiny holes) and short pointy tail. Belly marked with a row of slanting lines. Outline of head incomplete; possibly part of a horn visible. Right foreleg probably hoofed. Below, a dolphin (tail fin and part of body) diving into a sea rendered by triangular markings. Behind the quadruped's trunk, a narrow vertical object with transverse lines inside (column or end of a wall?). Above and to the right, remnant of a horizontal, ladder-like object. Below, horizontal lines.

Pres. H. 4.7; pres. W. c. 4.1; Th. 0.1-0.25. Bibl.: Poursat 1977a, no. 206b.

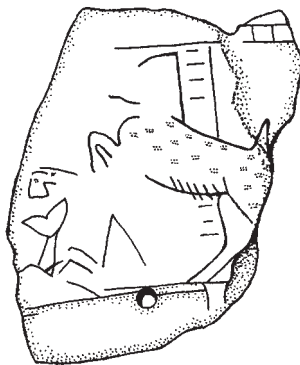


Fig. 8. *Py 2*. Drawing Alma Reijling.

*Py 3 (fig. 9)*

Shaft Grave I. ANM 210.\* Pyxis; fragment belonging to the lowest part of the side.

Attachment hole slightly above the lower edge. Surface strongly worn, partly splintered off. Slanting crack across centre.

Incised representation (incomplete): chariot turned to the left. Partly visible are a wheel, wagon, draught-pole (curved bar with inner

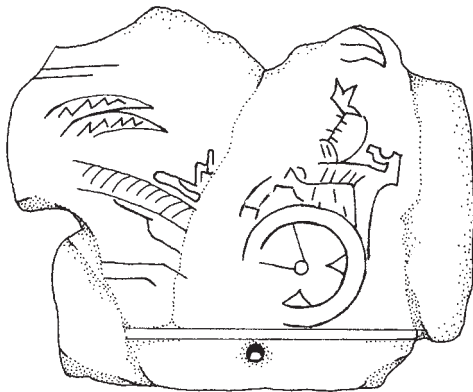


Fig. 9. *Py 3*. Drawing Alma Reijling.

hatching) and coupling, reins and sleeved arm. Before the chariot there are two long curving shapes with inner zigzags and pointy ends directed towards the right, resembling wings or horns. Above and below the draught-pole a pair of horizontal, rod-like lines. Picture bordered below by two parallel horizontal lines.

Pres. H. 5.6; pres. W. 7.4; max. Th. 0.4; estimated pyxis D. 12.8.

Bibl.: Poursat 1977a, no. 206b.

*Py 4*

Shaft Grave I. ANM 210.\* Pyxides; 24 fragments. Surface largely worn-off. Two rim fragments. Attachment hole or trace of one in seven or eight fragments.

Remnants of incised decoration: single and parallel horizontal lines, parallel lines with curves, running spirals, slightly curving ladder-shaped form, triangle, part of a notched shape with inner shading.

Pres. H. or W. of largest fragments: 6.1 x 3.3; 4.0 x 5.7; 5.6 x 4.0. Max. Th. 0.45.

Bibl.: Poursat 1977a, no. 206b.

*R 1 (fig. 10)*

Shaft Grave P. ANM 9188. Rosette.

High relief. Curving upper contour (slightly S-curved from the centre), smooth underneath; no trace of attachment. Sixteen pointy petals, each marked with an inner petal. The petals are defined by raised edges. A ring of relief dots surrounds the round heart.

D. 7.4 (Mylonas)/ 7.2 (Poursat); max. Th. 2 (Mylonas)/ c. 2 (Poursat).

Bibl.: Mylonas 1973, 225, no. 522, pl. 200b; Poursat 1977a, no. 239, pl. XIX.

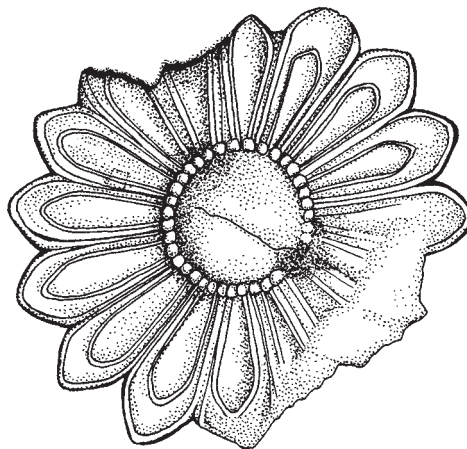


Fig. 10. *R 1*. Drawing Alma Reijling.

### S 1

Shaft Grave IV. ANM 575.\* Four strips.

The ends of the strips are bevelled (2), three-stepped and straight (1) or bevelled and straight, with a tiny pinhole (1).

L. 7.0-9.7; W. 1.5-1.9; Th. 0.4-0.65.

Bibl.: Karo 1930-33, no. 575, 244, fig. 101; Poursat 1977a, no. 213.

### S 2 (fig. 11)

Shaft Grave V. ANM 819, 897. Seven strips and nine strip fragments (4 larger, 5 smaller).

Convex upper surface divided by notches into horizontal segments. Flat underside with two pinholes and traces of use (scratches). One bone pin preserved.

L. 3.4-7.7 (ANM 897: 6); W. 0.5-0.6.

Bibl.: Karo 1930-33, nos. 819, 897; p. 246, pls. LXXI, CXLVI; Poursat 1977a, no. 222; Krzyszkowska 1988, 222-223.



Fig. 11. S 2. Schliemann 1878, p. 178, no. 228.

### S 3 (fig. 12)

Shaft Grave V. ANM 896. Four strips (two incomplete) and a fragment.

Narrow rectangles divided into six squares (each complete specimen) by transverse incisions. The upper edges are partly bevelled. The underside has two pinholes (one specimen) or two, deep transverse incisions (all others).

L. complete specimens 5.6 and 6.1; W. 1.1-1.2; Th. 0.4-0.5.

Bibl.: Karo 1930-33, no. 896, 353, pl. LXXI; Krzyszkowska 1988, 222-223.



Fig. 12. S 3. Schliemann 1878, p. 178, no. 227.

### S 4

Shaft Grave O. ANM 9570.\* Strips; 28 pieces, mostly fragments. A number of pieces have pinholes, slot-shaped mortises and bevelled corners.

Bibl.: Mylonas 1973, 207, no. 520, pl. 188.

### X 1

Shaft Grave II. ANM 226.\* Dozens of fragments. One fragment, probably belonging to the neck of

a vase, includes part of a flat, circular rim with two pinholes, below which a transversely notched band and a plain surface project. The pinholes are drilled diagonally through the rim. Vase fragment: L. 5.7; max. rim H. 0.7.

Bibl.: Karo 1930-33, no. 226, 319, pl. LXXII; Poursat 1977a, no. 207.

### X 2

Shaft Grave IV. ANM 507a.\* Five button-shaped objects.

Circular; flat on one side, curving on the other. The incised marks on the flat side include two dots connected by a straight line, three dots in a row, four dots arranged in a square and connected by a cross, and six dots arranged as on a die. The fifth mark is obscure.

D. 1.5-1.6, once 1.85; Th. 0.5-0.6.

Bibl.: Karo 1930-33, no. 507a, 244-245, pl. CI.

### X 3

Shaft Grave IV. ANM 507b.\* Knob-shaped object. Flat upper surface and underside; rounded back with semi-circular projection. The projection is on the side; above, it is paralleled by an arching rib set off at some distance from it. An incision runs around the back as far as the projection, close to the underside, which shows a hole.

Max. D. 1.2; H. 0.9.

Bibl.: Karo 1930-33, no. 507b, pl. CI.

### X 4 (fig. 13)

Shaft Grave V. ANM 894. Three appliqués and a fragment.

Curving, gradually tapering shape with flat, cut ends. Convex upper surface; flat underside with three pinholes, one of which runs at an angle to the cut face of the thin end. In shape two specimens are mirror images.

L. 7.4 (twice) and 8.9; max. W. 1.3; Th. 0.6-0.7.

Bibl.: Karo 1930-33, no. 894, pl. LXXI; Krzyszkowska 1988, 222-223, pl. 28c.



Fig. 13. X 4. Schliemann 1878, p. 178, no. 224.



X 5 (fig. 14)

Shaft Grave V. ANM 895. Two appliqués.

Curving, tapering shape, sharply pointed at one end. Convex upper surface divided into segments by transverse notches. Flat underside with two pinholes. In shape the appliqués are mirror images.

L. 5.5; W. 0.8; Th. 0.7-0.8.

Bibl.: Karo 1930-33, no. 895, pl. LXXI; Krzyszkowska 1988, 222-223, pl. 28d.

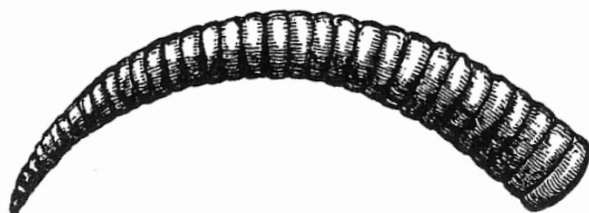


Fig. 14. X 5. Schliemann 1878, p. 178, no. 225.

X 6

Shaft Grave VI. ANM 937.\* Seven fragments.

Possibly parts of hilts and pommels.

Bibl.: Karo 1930-33, no. 937.

X 7

Shaft Grave Δ. ANM 9609.\* Dozens of fragments.

Bibl.: Mylonas 1973, pl. 72b.

X 8-13

Shaft Graves I, Α, Ν. ANM 9616, 9626, 9633, 9640, 9645, 9657. Fragments.

Bibl.: Poursat 1977a, sub nos. 234-236.

### 3 CHRONOLOGY

In his discussion of the chronology of the Circle B graves G. Graziadio concludes that 'the entire burial sequence of the two Circles might have lasted little more than a century, corresponding to four generations. Circle B was probably in use for three generations, Circle A for two. Moreover,' he continues, 'Dickinson has suggested that the last generation of Circle B might have overlapped the first of Circle A.'<sup>3</sup>

All the graves in Circle A contained ivories (I-VI), the greater part of which lay in Graves IV and, to a somewhat lesser extent, V. In Circle B ivory was found in 9 of the 26 graves (A, Γ, Δ, Z, I, Α, Ν, Ο, Ρ).

Regarding Circle B Graziadio distinguishes an Early Phase, Late Phase I and Late Phase II.<sup>4</sup> The Early Phase corresponds with a late, but not the final, period of MH.<sup>5</sup> He places the pottery attrib-

uted to Late Phase I at the extreme end of the MH period, contemporaneous with early LM IA. The latest pottery in this Circle dates to LH I and can be attributed to Late Phase II.<sup>6</sup> O. Dickinson remarks that LH I must have originated in a ripe phase of LM I A.<sup>7</sup>

The Graves Z and I, considered by Graziadio as part of the Early Phase,<sup>8</sup> contained ivory. Consequently, Ha 7, Po 17-19 and X 8, coming from those graves, are the oldest Shaft Grave ivories we know of (MH III/MM III?). Concerning Grave P (R 1) a date in the Early Phase is doubtful. The pottery from Graves A, Γ, Δ, Α, Ν and Ο is assigned by Graziadio to Late Phase I and/or II; however - with the exception of Grave Ν - it can possibly be from a different phase or subphase.<sup>9</sup>

The earliest burials in Circle A (Graves II and VI, the oldest burials of Graves IV, V and, possibly, III) are contemporaneous with Late Phase II in Circle B.<sup>10</sup> The latest burials, as found in Grave I, are dated by Dickinson over a relatively short period between ripe LH I and early LH IIA.<sup>11</sup> Therefore the latest of the recovered Shaft Grave ivories are Py 1-4, discovered in Grave I.

Thus the earliest and the latest ivories of the Shaft Graves date from late MH and early LH IIA, respectively. In Circle A the ivories were not interred before LH I (i.e. ripe LM IA), and in Circle B, for the most part, probably not earlier than the end of MH (i.e. early LM IA).

### 4 TECHNIQUE

Ivory cannot simply be worked in a raw state. The base of an elephant tusk is surrounded by a rind of cementum also called the 'bark'.<sup>12</sup> Similarly, the lower canines of a hippopotamus, namely the tusks that grow longest, are also covered with this substance on one side, and a layer of enamel coats the other two surfaces. Particularly the hardness of the enamel, which is comparable to that of jade or agate, would hinder an ivory-cutter.<sup>13</sup>

Then how was this enamel removed in Antiquity? A small segment of a lower canine of a hippopotamus was found in an Early Minoan context under the West Court of the palace of Knossos. The enamel had been removed for the greater part by scouring.<sup>14</sup> However, O. Krzyszkowska cannot easily accept that such laborious work was executed on entire tusks. Instead she wonders whether the enamel was exposed to heat, so that it burst and split off because of dehydration.<sup>15</sup> According to C. Ritchie, a similar technique was employed by traditional Chinese and Japanese ivory-cutters.<sup>16</sup>

The tools and methods used to cut ivory must for the most part have resembled those of woodcutters, as ivory corresponds in hardness with species of hardwood like box or cedar.<sup>17</sup>

In the 'House of the Ivories', the LM IB ivory-cutters' workshop on the Royal Road at Knossos,<sup>18</sup> awls, points, gravers, chisels, saw and knife were recovered, all made of bronze or copper and, nearly all, fragmentary. In addition, some general purpose stone tools,<sup>19</sup> lumps of pumice and obsidian were also among the finds. Drills, files and measuring instruments were not attested.

According to R. Barnett, the upper side of a modern ivory-cutter's chisel is often mushroom-shaped, which makes it possible to hit or press the instrument by hand instead of with a mallet.<sup>20</sup> D. Evely deduces from marks on Minoan Neo-Palatial ivories that the Minoans had a great variety of chisels. As the basic variants he mentions the chisel with a straight cutting edge and the one with a curved cutting edge (the bull-nosed type).<sup>21</sup> I. Sakellarakis' view that a knife is much more suitable than a chisel for cutting ivory is difficult to agree with.<sup>22</sup> The motion of a knife is different, less subtle than that of a chisel, and is therefore much less suited to carving.

As a proof of the use of the compass Sakellarakis cites Mycenaean ivory discs on which parts of an incised circle and, in one case, a central recessed point are perceptible. Other pieces of Mycenaean ivory postdating the Shaft Graves show incisions marking off measured distances.<sup>23</sup>

The designs on the Shaft Grave ivories were made not only by means of reliefwork and incising. An additional decoration technique - during the Bronze Age probably limited to the Aegean area - involved the application of gold, as seen in the combs C 1-3 and the hilts Hi 1-3. Four of these six objects were unearthed in Grave IV; C 1 comes from Grave III, C 3 from Grave V. The frames of the combs are gold-plated, and the hilts are inlaid with gold patterns. Moreover, the ivory hilt plates are held in place by bronze pins with a gold-plated head at either end.

Referring to Hi 1 and Hi 3 (fig. 6) A. Xenaki-Sakellariou describes the technique that was employed for making decorative patterns of inlaid gold. Pieces of gold thread were fastened to the object by inserting their bent extremities into tiny holes and subsequently hammered flat. She believes that this technique was invented on the Greek mainland.<sup>24</sup>

As far back as the Old Palace Period the

Cretans were familiar with the application of gold on ivory. We have for instance the well-known bronze sword from the palace of Mallia, of which the 21 cm long ivory hilt is plated with gold (MM II). The gold shows an engraved herringbone pattern.<sup>25</sup> In addition, the palace of Phaistos has yielded an ivory lion's head with gilded mane, thought to be a toy (MM IB-II).<sup>26</sup> The examples from the Neo-Palace Period are the famous ivory bull-leapers with gold-plated bronze locks (MM IIIB, palace of Knossos)<sup>27</sup> and a game board with an ivory frame covered with gold leaf (MM IIIB, palace of Knossos).<sup>28</sup> Gold fragments that were discovered together with parts of the ivory 'Palaikastro Kouros' constitute part of our evidence that the technique of gilding remained in use during LM IB<sup>29</sup> (see also section 7, C 1). It seems therefore obvious to assume that the technique and skills of the artisans who added the gold embellishments to the Shaft Grave ivories drew on know-how which had been current in Crete for many years. On the other hand, the decoration technique applied to Hi 1 and Hi 3 (and probably also to Hi 2) possibly originated on the mainland itself.

## 5 KINDS OF IVORY

Research by Krzyszkowska demonstrates that not only elephants but also hippopotamuses would have been the source of the Aegean ivory supply during the Bronze Age.<sup>30</sup> The question of the geographical source of ivory, however, must go unanswered for the time being. The elephant ivory could be from the African elephant (*Loxodonta africana*) as well as from the Asiatic species (*Elephas maximus*) which may have lived in Syria till the 8th or 7th century BC.<sup>31</sup> The hippopotamus (*Hippopotamus amphibius*), which to this day occurs in West, Middle, East and South Africa,<sup>32</sup> was until recently also among the fauna of Egypt;<sup>33</sup> in Antiquity, moreover, it was probably also met in Syria (remains from the 14th/13th centuries) and Palestine (12th-4th centuries).<sup>34</sup>

For the most part, the ivory of the Shaft Graves appears to be from elephants. Only a few applied pieces and strips in Shaft Graves V and O might very possibly be made of hippopotamus ivory: Pl 2, S 2 (specimen ANM 897)-4, X 4, X 5.<sup>35</sup>

## 6 TYPES AND FORMS

However incomplete the ivories of the Shaft Graves may be, ivory was obviously considered especially suitable for the embellishment of

swords, daggers and knives. Almost half of the 76 catalogue entries are definitely pommels (25) and the facings of the hilts of the swords and daggers (6 or more) and knife handles (3 or more). Apart from weapons, ivory also served to adorn toilet articles (C 1-5, Ha 5, Py 1-4) and acted as inlays and facings for wooden objects (B 1, D 1, Pl 1-5, S 1-4, X 2-5). The nature and function of only a small number of fragments cannot easily be determined (X 1 for the greater part, X 7-13). Additional kinds of objects among the Shaft Grave ivories are a possible attachment (A 1), handle of unknown application (Ha 4), needle (N 1), possibly parts of pins (Pi 1-2), rosette (R 1) and a fragment probably belonging to a vase (X 1).

In both Circles the pommels form by far the biggest group (12 catalogue entries in A and 13 in B). In Circle B no ivory hilt and only two ivory handles (Ha 6-7) were come across. The ivories from this Circle are fewer than those from Circle A (44 to 32 catalogue entries) and, among them, hardly any pieces are especially remarkable (R 1).

### 6.1 Components of weapons

#### Knife handles

At least three knives, whether or not weapons, are furnished with ivory handles: Ha 1 from Circle A, Ha 6 and 7 from Circle B.

The elegant Ha 1, measuring more than 20 cm long, has a handle with a curving surface which was apparently cut from one piece of ivory; its long shape narrows towards a thickened, knobby end. The blade is inserted into a groove and fastened by four pins. Ha 1 is a so-called single-edged type.<sup>36</sup>

Enough of Ha 6's handle remains to allow for a comparison with that of Ha 1. The greatest difference is that the handle of Ha 6 is constructed of two plates. The common traits of both handles, on the other hand, are a curving surface and an elongated, triangular form. Also the placement of their four pinholes corresponds: three close to the blade, arranged triangularly, and one closer to the middle of the handle. To judge from an illustration in G. Mylonas,<sup>37</sup> a loose fragment of Ha 6 seems to be knob-shaped and would probably belong to the handle's outer end.

Mylonas divides the knives from Circle B into two groups. One group includes nine single-edged specimens (found in six graves); they can be further subdivided according to the manner in which the handle is fastened to the blade tang. The other group, which includes Ha 7, is made

up of nine tongue-shaped specimens (found in eight graves) with a double-edged, fairly thin blade whose greatest width is a short distance from the point. Their rod-shaped tang widens into a forked section which was inserted into the handle. The two parts were fastened by hammering (Ha 7) or by hammering in combination with the use of pins.<sup>38</sup>

The nearly unrecognizable remains of Ha 7's ivory are seen on the transverse projection at the tang. This knife, which was at least 26 cm long, is crowned at the end of the handle by a rock crystal knob of modest size and more or less cylindrical form.

The fragments of bronze blades that preserve traces of pinned, ivory facings could belong to large knives (Ha 2 and 3) as well as to daggers or swords. In my view, the minuscule points situated around the pinholes of Ha 2 are not decoration but mark the spots where the holes were to be made.

In Crete ivory knife handles are unknown before LM II.

#### Hilts

With the exception of Hi 4 (*fig. 4*) and 5, the hilts (Hi 1-6),<sup>39</sup> in one instance belonging to a sword (Hi 3), are sufficiently preserved to give an impression of their original shape. Both Hi 1 and 2 consisted of two matching ivory plates which were fastened to the tang by means of several pins with heads on either side; the edges of the plates coincided with the contour of the tang and the top of the blade. The plates of Hi 1 terminate in a graceful curve, that of Hi 2 in a point. Only the bases of the handles of Hi 1 and 2 remain. The upper contour of the ivory hilt plate of Hi 2 has a curving form, which means that the ivory plate did not continue on to the now missing tang, as is the case in the sword hilt Hi 3 (*fig. 6*). It is nevertheless possible that a separate ivory plate covered the tang of Hi 2.

In contrast to the other hilts, Hi 6 has less the character of an attachment plate because of its greater volume. It is basically a rectangular block with two slightly concave sides and a curving surface. The bronze tang is inserted into the ivory and kept in place by one pin only.

According to G. Karo, the top of the blade of Hi 4<sup>40</sup> shows remnants of ivory.<sup>41</sup> The pinholes in the blade indicate that the three preserved pins fastened the hilt directly next to the edge of the bronze. Traces of an ivory hilt have also been preserved on the alabaster pommel of a dagger (Hi

5), that is, on the outside of the protruding edge around the hole in the underside where there remains a lump of bronze and ivory.

Hi 3 (*fig. 6*) is an incomplete hilt which remains on the sword, which is type B.<sup>42</sup> The tang and the wide part of the upper blade were faced on either side by a more or less T-shaped ivory plate. The lower edge of the ivory over the wide section is slightly convex. The side edges are comparable to those of Hi 1. The ivory is fastened to the tang and the top of the blade by six double-headed pins, four placed along the vertical axis and one on either side of the lowermost pin.

Because most of the hilts that would have been in Grave Circle A have completely vanished, Karo concludes that the lost hilts were for the most part wooden.<sup>43</sup> Indeed, the predominant use of wood seems highly likely. On the other hand, the small remains of an ivory hilt such as Hi 4 make it plausible that the original number of ivory hilts in Circle A was greater than the evidence might seem to suggest.

The sword from Mallia<sup>44</sup> mentioned in section 4 demonstrates that ivory hilts similar to Hi 3 were made in Crete as early as MM II. The Mallia hilt, as would originally have applied also to Hi 3, consists of two identical plates, each covering one side of the tang and the top of the blade. The wide section at the top of the blade is, however, apart from its convex lower edge, of different shape. In both swords the hilts were fastened with pins.

## Pommels

With regard to Grave Circle A, Karo distinguishes high, dome-shaped pommels, like Po 1, 3 and 6, which he considers particularly suitable for big swords, and flattened, dome-shaped pommels which, especially the smaller specimens made of ivory (Po 7 and 8) or alabaster, more likely belong instead to daggers or short swords. This last mentioned type consists either of two joined parts, a knob and plug, or of one piece which in shape resembles the first type, that is, a knob with a curved stem.<sup>45</sup> Among the ivory pommels, including fragments, as catalogued by Karo, the plug seems, in fact, to be lacking. In addition, it appears that the hole in the underside of an ivory pommel may vary from round (Po 1) to rectangular (Po 3) and square (Po 8). A characteristic feature of a pommel knob is that the pinhole runs horizontally through it; the huge Po 1 even has two transverse pinholes.<sup>46</sup>

With a maximum diameter of 7.1 cm and its

hollow, globular form Po 1 occupies a distinctive place among ivory pommels. Moreover, it is one of the few specimens bearing a representation (*fig. 7*). According to Karo, Po 1 was probably filled with a soft material.<sup>47</sup>

Mylonas observes that almost all the swords from Grave Circle B were furnished with ivory or alabaster pommels. In his opinion, the pommel is a special Mycenaean feature. Although he considers it certain that the type A swords, 12 of which lay in Grave Circle B, are Cretan exports, he points out that no pommels are attested in Crete from the time of older type A specimens in the possession of Mycenaeans. In addition, pommels are depicted on Mycenaean gems and rings from Grave Circle A. Mylonas concludes that the Mycenaeans themselves added pommels to the type A swords they imported from Crete.<sup>48</sup>

Since the Shaft Graves contained pieces of raw ivory which suggest the existence of a local ivory industry, it is highly possible that, contemporaneously, ivory pommels were actually manufactured at Mycenae itself (see section 8.1). However, the first Mycenaean who cut a pommel, either in ivory or another material like wood or bone, or who commissioned an artisan to do so would have got the idea from a foreign model, or possibly from a foreigner. Crete seems the most obvious source: it was here that ivory pommels were cut at least as early as the Old Palace Period.

Cretan ivory pommels dating earlier than the Mycenae Shaft Graves have been discovered at Arkhanes (EM III-MM I)<sup>49</sup> and Platanos (EM II-MM II). The biggest of the three examples from Platanos is mushroom-shaped, measures 5.0 cm in diameter, and has a transverse pinhole and a hole underneath. A smaller specimen is spherical.<sup>50</sup> If met in the Shaft Graves, such pommels would not attract special attention. The hemispherical shape is, judging from the illustration in Mylonas, attested in Po 13 from Shaft Grave Γ.<sup>51</sup> A Cretan ivory pommel of much later date is, for instance, the enormous example (average D. 8.6 cm) from the Unexplored Mansion at Knossos (LM II).<sup>52</sup>

## 6.2 Toilet articles

### Combs

Of the five combs (C 1-5), one is designed to be worn in the hair (C 2) and at least three are suitable for actual combing (C 1, 3 and 4). The comb C 5, apparently incomplete and fragmentary, is mentioned by Mylonas,<sup>53</sup> but neither described,



depicted nor catalogued.

It is notable that three combs are furnished with a partial covering of gold plate (C 1-3). The four-sided frame of the semi-circular comb (C 2) is wrapped in it, apart from the toothed side. On both sides of the frames of C 1 and 3 the upper edges of the strips of gold plate are folded round the back of the comb. In both instances the gold plate forms a projection in the middle of the top, crescent-shaped in C 3, incompletely preserved and probably rounded in C 1. The ends of the gold strips of C 1 slant.

The remains of C 1 show that the central section of the comb was flat and rectangular and, in cross-section, tapered downwards. The comb frame thickens at one end where the contour of the narrow side resembles that of a peanut shell, rounded on top and bottom, slightly constricted at the halfway point. The long vertical break near the bottom indicates that the comb must have had a handle. This end fragment was neither furnished with teeth nor, it seems, covered with gold plate. The shape of the comb's other end can no longer be determined.

C 3 has a flat and rectangular frame with two separate side extensions or handles which curve gracefully. Each is flat, tapers outwards and is broken off at the tip. In light of their resemblance to the singular, separately fastened handle of C 4 the wings of C 3 must originally have been quite a bit longer than they are now.

The comb frame of C 4 is marked by a concave upper edge which forms an S curve together with the upper contours of the folding extension, which curves downwards. The comb, 6 cm long, is roughly half the size of C 1 and C 3.

In short, C 1, 3 and 4 each have a distinctive shape, despite obvious similarities (C 1 and 3, covered with gold plate; C 3 and 4, construction and shape of the handle).

J.-C. Poursat distinguishes in his survey of Aegean ivory combs between the '*peigne à corne*' (LH I-II), the '*manche rectangulaire à rosette*' (LH II-III) and two fragmentary combs which seem to be neither type. To the first type he assigns five combs, including C 4, which are characterized by a long bent handle which thins towards the end. The handle and comb frame appear to have been made separately and then joined. Three specimens are decorated. The second type is much more numerous and, in contrast with the first, also known in Crete. Characteristic is the rectangular shape. The teeth and frame are cut either from the same piece or from separate pieces of ivory. In the latter case the toothed section is fas-

tened in a groove on the bottom of the frame. The 25 decorated specimens (and some undecorated ones too) show, according to Poursat, two purely Mycenaean details: 1, the frame is divided into two superimposed friezes separated by a line or a series of dots in relief; 2, a relief rosette marks the centre of the top of the rim (or, exceptionally, a motif of comparable form, like the coiling crocodile tails on a comb from Palaikastro). The combs with two friezes can be subdivided into those in which the frame, seen in cross-section, has straight sides or those, especially from Mycenae, which have convex sides owing to the curving shape of the rim. Each of the two fragmentary combs has one well-defined frieze engraved with a very peculiar pattern of geometric motifs. Poursat is uncertain whether they constitute a transitional type or are *peignes à corne*.<sup>54</sup>

Poursat pays no attention to C 1 and 3. In a comparison with the above-mentioned types we see the following. C 3 has the central projection on the rim of the *peigne à rosette*, despite the fact that the shape is different and it has been made of gold plate, and the handle of the *peigne à corne*; however, the S curve in the upper contour of the latter type is lacking and, moreover, there is a second handle (?). C 1 also has a central projection on the rim, formed by the gold covering. The decoration, however, is confined to a single frieze. Although the comb had a handle, it differed from the *peigne à corne* type: the handle was not connected to the entire side but, nearly at the bottom, stuck out. In contrast to the *peigne à corne*, the decorated area was possibly not made of a separate piece of ivory.

Poursat is at a loss as to the origin of the *peigne à rosette*.<sup>55</sup> Nevertheless, some light can be shed on one aspect of the type's development. The earliest example mentioned by Poursat is the comb from Palaikastro (LM IB context), which like C 1 and 3 bears a motif other than a rosette on the rim. To this group two specimens from Shaft Grave IV can be added: four gold strips with crescent-shaped projections were doubtless the facings of ivory or wooden combs.<sup>56</sup> This early evidence shows that the practice of embellishing combs with a central projection on the rim had already been long in existence and that the standard rim ornament of a rosette had been preceded by other motifs.<sup>57</sup>

C 2 is a unique variant of a particular type of ivory comb which has only been met in mainland Greece; remarkably enough, Poursat does not class it with the *peignes de coiffure*. The fragments of *peignes de coiffure* from a later period illustrated

by him are of coarser workmanship: the teeth are much wider and more solid and, as a consequence, have been better preserved. On one side, the tops of these later *peignes de coiffure* are thickened.<sup>58</sup>

Whereas Karo describes C 2 as a 'feines Gebrauchsstück',<sup>59</sup> S. Hood writes that it is 'defiantly barbarous in its sordid use of fine material',<sup>60</sup> provided with a 'clumsy gold covering'.<sup>61</sup> We can speculate, however, whether the object's slovenly appearance in Karo's illustration<sup>62</sup> - a number of teeth criss-cross, the gold plate is distorted - is not simply caused by the ravages of time.

#### Mirror handle

Mirror handle Ha 5 (*fig. 5*) has been heavily battered. It consisted of a shaft, now all but lost, that ended in a wider, slotted part at the top. Little remains of the two plates of which the wider upper part was constructed - one plate is nearly completely missing, less than half of the other one is left. Nevertheless, the slot remains and continues to hold a remnant of the bronze mirror. The plates were joined with pins, as indicated by a pinhole with a partial pin.

J. Schäfer points out that a common element of later Mycenaean mirror handles can already be seen in Ha 5, namely the attachment of relief carving and a shaft. However, he does not consider Ha 5 a predecessor because the palm leaves which adorn the top of the shaft of the later Mycenaean examples are lacking. Although the idea to integrate relief carving with a mirror shaft may derive from Egypt, he sees no typological link with Near Eastern or Egyptian forms.<sup>63</sup>

All the Cretan ivory handles that definitely belong to mirrors are of later date. The best-preserved specimens, from Phaistos (LM II-IIIa) and Knossos (LM II-IIIa), are the palm leaf type.<sup>64</sup>

#### Pyxides

The only ivory from Shaft Grave I consists of a number of pyxis fragments (Py 1-4). Three pyxides can be distinguished (Py 1-3); among the remaining 24 fragments - referred to as Py 4 - are perhaps some which also could belong to Py 1-3. The Py 1-3 fragments come from the lowest part of the side; Py 4 includes two other rim fragments.

With regard to Py 1 and 3 enough of the wall has been preserved to estimate the diameter with some reliability, 10.1 and 12.8 cm, respectively.

The maximum thickness of Py 1-4 varies from 0.25 to 0.45 cm. Karo points out that the walls are thin in comparison to that of other, complete Mycenaean pyxides, and therefore suggests that the fragments may have covered a wooden inner pyxis.<sup>65</sup> Py 1 and 3 show holes along their lower edges, but they conceivably served to fasten the bottom. However, the latter cannot apply to the several holes in Py 4 fragments which are not from the bottom of the side. Perhaps they indeed were used to attach the ivory to an inner wooden form.

Poursat distinguishes three types of ivory pyxides. First, the high type, whose height is equal to about twice the diameter, and which is decorated with vertical bands or friezes. Second, the standard type (among which three specimens from Crete), of which the height and diameter are roughly equal. And lastly the thin-walled type. According to Poursat, the fragments Py 1-4 belong to pyxides of the thin-walled type, known from Mycenae and Routsis only. Poursat maintained that, in comparison to other pyxides, this type has a characteristically much thinner wall: 0.3 cm as compared to 1.0-1.5 cm.<sup>66</sup> Of the two recorded high pyxides, however, one wall is 0.4-0.6 cm thick, the other, insofar as preserved, 0.65 cm thick.<sup>67</sup>

The three Cretan ivory pyxides bear carved representations and come from Ayia Triadha (fragment from LM IB).<sup>68</sup> Katsamba (LM II context, but perhaps to be dated in LM IB)<sup>69</sup> and Arkhanes (fragment from LM IIIa).<sup>70</sup> Possibly, they were partly made in the same period as Py 1-4: for Shaft Grave I contained the latest of all the Shaft Grave burials at Mycenae (see section 3).

#### 6.3 Inlays and appliqué

Inlays and appliqué work can be subdivided into plaques (the squares of B 1, Pl 1-5), strips (the ledges of B 1, S 1-4), button-shaped objects (X 2), knob-shaped object (X 3) and oblong bent pieces which taper gradually. But inlay and appliqué, in fact, extend beyond a single category, for, as seen above, the techniques were used to adorn knife handles, hilts, pommels and pyxides.

#### Box

B 1, a wooden box of which the upper and lower sides are missing, is decorated in both inlay and appliqué techniques. On two sides inlaid ivory squares border both edges. On two other sides appliqués of wooden dogs figure prominently,

placed on bipartite, horizontal ivory ledges which, in turn, appear to be supported by vertical wooden plates. On one side the wooden plates are divided in four by transverse incisions.<sup>71</sup>

The upper ledge overhangs the lower one on one side and projects over the entire length of the lower ledge. B. Schweitzer draws a parallel to the two or three descending steps of the Minoan *geison* which covers the ends of the transverse roof beams. Perhaps the ivory reliefs are then schematic representations of flat house roofs on which the dogs are lying.<sup>72</sup> The motif might have originated not in Crete but in Egypt, where jackals, the guardians of the City of the Dead, and occasionally dogs were represented lying on the roofs of sepulchral buildings and mastabas since the Old Kingdom. The schematization might be of Egyptian origin too. Schweitzer refers to Ramses III's sarcophagus where Isis is flanked by watchdogs which appear to be placed on a kind of stand. Since the Old Kingdom, Anubis or Wepwewe, gods with a jackal's or dog's head, were portrayed on such stands.<sup>73</sup> Although such references to Egyptian art seem outdated, Poursat remarked that Schweitzer made a point by showing the Egyptian origin of the boxes decoration.<sup>74</sup> Moreover, E. Vermeule is convinced by Schweitzer's suggestion that the theme is Egyptian.<sup>75</sup> As early as the 1930s, however, Karo questioned Schweitzer's interpretation of the subject as watchdogs on flat roofs; the ivory ledges and the wooden plates below them reminded him of pedestals or consoles, comparable to the ones in Cretan representations.<sup>76</sup>

Indeed, there seems to be sufficient visual material to make it plausible that the rectangles, as it were, piled on top of each other, are a 'quotation' from Minoan architecture.<sup>77</sup> In my view, a possible Egyptian source, on the other hand, cannot be proved: the resemblance to Egyptian representations is far too general and the tracing back of a supposedly abbreviated depiction to a leashed dog on some kind of stand is rather far-fetched.

The wooden dogs, conceivably made by the same hand as the ivory pieces, seem to be without parallel in Minoan art. They are clumsily rendered. The dog looking round, for instance, has a long, drawn-out body composed of two heavy lumps and a thinner waist. The dog below it walks only on its forepaws. Nevertheless, the dogs are anything but lifeless. H. Kantor sees 'dogs whose vividly rendered motion seems derived from the Minoan tradition for vigorous animal movement'.<sup>78</sup> A. Persson posits an Egyptian origin and considers it likely that the completed box was

imported from Egypt. An important indication of Egyptian workmanship would, in his opinion, be the kind of wood employed: sycamore.<sup>79</sup> Hood observes, however, that the sycamore is a northern tree, although Persson implicitly suggests that the box is made of Egyptian sycamore. At any rate, Hood sees no reason to consider either the box or the dogs as Egyptian.<sup>80</sup>

The earliest known Cretan evidence for a box covering is perhaps a number of Middle Minoan ivory plaques from House Tomb 1 in Gournia, which appear to have been fastened with pins.<sup>81</sup>

### Disc

Mylonas regards D 1 (*fig. 3*), a disc with many careless perforations, as a small wheel or table toy.<sup>82</sup> The pin preserved in one hole, however, suggests we are dealing with an appliqué. The round holes in the ivory plaque fragments Pl 4,<sup>83</sup> which were found together with the disc D 1, seem to support this impression.

### Plaques

Among the plaques Pl 1-5 we find rectangles (Pl 1, 3, 5; for squares see B 1), almond shapes (Pl 3) and a bent form (Pl 4). Besides the flat ivory plaques with their simple contours we find the so-called D plaques (Pl 2): these smooth, convex pieces are, in this instance, more or less rectangular and, for the most part, have tapering long sides. Apart from Pl 5, the surfaces of the Mycenae ivory plaques are not decorated. Mylonas estimates that Pl 5, which is incomplete, originally measured 7.5 x 4.5 cm.<sup>84</sup>

For the fastening of Pl 1-5, pins as well as glue might have been used. Some Pl 1 fragments (not illustrated by Karo) apparently show pinholes and remnants of bronze oxide.<sup>85</sup> In Pl 2, on the other hand, no trace of the fastening method can be discerned,<sup>86</sup> so glueing seems certain. The manner in which Pl 3 and 4 were fastened is more difficult to determine. True, they are copiously furnished with holes, but these may all have been made for aesthetic reasons. The strongest evidence for the use of glue is seen in Pl 5. Sakellarakis illustrates several ivory plaques from Mycenae which, in his opinion, were glued on the back. Although the glue has vanished, the back is provided with regular, fine scratches made in different patterns, most usually diamonds, which were intended to absorb the glue in order to fix the ivory more strongly.<sup>87</sup> The back of Pl 5 has a scratched diamond pattern too. Ivories with

scratched backs have further turned up in Crete, in the House of the Ivories at Knossos (LM IB).<sup>88</sup> Apart from such ivories, the use of glue at Mycenae would seem to be evidenced by a find in the ivory-cutter's workshop in the Atelier of the Artists (citadel): a yellowish mass, composed of a mixture of colophonium and sulphur, which evidently turns into a strong blackish-brown glue when heated to an extremely high temperature.<sup>89</sup>

In Crete, ivory (and bone) D plaques were produced as early as the Old Palace Period (Mallia) and are known from the House of the Ivories at Knossos.<sup>90</sup>

### Strips

The ivory strips (B 1, S 1-4) greatly differ in appearance. S 2 includes strips of perfectly rectangular shape. The strips S 1, 3 and 4, in contrast, are partly bevelled, either at one end or both. Such strips may have served as frames. Moreover, S 2 (*fig. 11*) is distinguished from the others by its convex upper surface divided transversely by notches into segments. Also the flat upper surfaces of S 3 (*fig. 12*) are marked with transverse incisions, which divide them into squares. In the discussion of the wooden box (B 1) we already noted the bipartite ivory ledges below the dogs. A similar strip, but this time tripartite, is included in S 1.

It seems, for the most part, that the strips must have been fastened by slipping them over a tenon, as S 2, S 3 (one piece) and S 4 (few pieces) are provided with mortises underneath. In addition, a mortise can be seen in one specimen of S 1; it is located on the side. Most specimens of S 3 have two deep transverse incisions underneath. A number of S 4 pieces are slotted, probably for dowels. The method used to fasten the ledges to the box B 1 is not clear; according to Schweitzer they are glued,<sup>91</sup> whereas Karo thinks they are fastened with pins.<sup>92</sup>

Cretan ivory strips strongly resembling S 2 (*fig. 11*) and predating it come from the palaces of Knossos and Phaistos. Those from Knossos are part of a game board ascribed by A. Evans to MM IIIB. They are ribbed, have rounded, gold-plated upper surfaces, and are flat underneath.<sup>93</sup> From the Old Palace of Phaistos (MM IB-II) comes a little rectangular plate with a negative undulating profile: the upper surface is divided lengthwise by ribs into concave zones. The underside is flat and has no holes.<sup>94</sup> An ivory of type S 2 has come to light at Palaikastro too. It is an irregularly shaped quadrangle with an undulating upper surface and a flat underside supplied with four

holes. One undulation, however, is bevelled in the middle and flattened at the end, where there is a fifth hole. Its date has not been determined, whereas the context of a similar ivory fragment, also from Palaikastro, has been adjusted to LM IB.<sup>95</sup> Flat and rounded bone strips with a ribbed or undulating upper surface have been recovered in the Chrysolakkos funerary complex near Mallia (MM II). P. Demargne makes no mention of pinholes. Nor is it clear whether there are any curving strips with flat undersides among them.<sup>96</sup>

### Miscellaneous

Five button-shaped ivories with convex tops (X 2) could have once decorated a wooden object, although the incised points on the flat sides arranged like the points of a die, in two instances joined by lines, make the modern observer think rather of game men.<sup>97</sup> On the other hand, perhaps the incisions indicated where the artisan had to attach. Another possibility is that the incisions were made to absorb glue and to strengthen the attachment. If so, the seemingly numerical sequence of the incised points (two, three, four and six, respectively; one incision unclear) would be merely coincidental.

X 3 is a knob-shaped object, flat on the top and bottom, curving on the side. Underneath there is a hole, on the side a projection. An incised line runs around the side up to the projection. In side view, the projection is semicircular; above, there is a parallel arching rib, set off at some distance from the projection. Perhaps X 3 was attached by means of both the projection and the hole underneath.

X 4 and 5 (*figs. 13, 14*) are curving, tapering appliqués with convex upper surfaces, resembling horns or tusks. Underneath they are flat and provided with mortises.<sup>98</sup> Each of the two X 5 specimens has a pointy end. The main difference between X 4 and X 5 is the treatment of the upper surface. In X 4 the appliqués are smoothly polished; in X 5 they are segmented by grooves forming, as it were, half-rings, as also seen on the tops of S 2, also found in Shaft Grave V (*fig. 11*).

In Crete, some ivory seals from EM II-MM IA also curve and taper like a horn or tusk. In cross-section, however, they are not semicircular but round.<sup>99</sup> Resembling X 5 (*fig. 14*) are bone or ivory fragments from Knossos (MM IIIB) which Evans calls bracelets.<sup>100</sup> The form indeed reminds one of flat bracelets. The inside is smooth and shows a few transverse grooves. The outside is divided into segments by crosswise incisions which create an undulating profile.



## 6.4 Other objects

### Toggle

Karo compares A 1, an elongated ivory object with tapering ends, to one silver and four gold toggles; the latter also come from Shaft Grave IV, the former from Grave V. The toggles acted as adjustable fastenings for sword and shield belts. However, Karo points out that in contrast to the metal toggles A 1 has a rectangular opening in the middle. The difference is fundamental as the gold and silver toggles have a narrowing rather than an opening in the middle. The narrow points of the metal toggles are surrounded by an attached gold strip with perforations which could be passed through a cleft or a dovetail-shaped opening in a belt and thus be fastened.<sup>101</sup> A striking similarity between A 1 and one gold toggle consists of the transverse grooves at the ends (three on either side). A 1 was probably used to fasten a strap or narrow belt, which was inserted into the central opening. Its small size makes the ivory unsuitable for the wider strap of a sword or shield (0.9 x 0.3 cm).

### Handle

At its upper end the incompletely preserved handle Ha 4 shows traces of bronze, the origin of which is obscure. The form, a downward tapering cylinder, and the small size - the diameter varies from one to not even two centimetres - exclude that the object formed part of a sword or dagger.

### Needles and pins

N 1 is most likely the upper part of a needle. The cylindrical shaft is partly smooth and partly surrounded by a group of incisions. At the top we see a projecting section of the ring which formed the eye.<sup>102</sup>

Another fragment (Pi 2), also from Shaft Grave A, consists only of a shaft. It remains uncertain whether the fragment indeed belongs to a pin or a needle. Like N 1, the fragment has broken off in its smooth section. At the top three incisions surround the shaft. It is difficult to decide whether the upper end is broken off. Mylonas calls the object a needle,<sup>103</sup> probably on the analogy of N 1, although no trace of an eye remains.

Pi 1, which is perhaps also part of a pin, resembles a pinhead. This mushroom-shaped object has a cylindrical collar with a round cavity in the cen-

tre which is furnished with half a dozen drill-holes inside. Slightly above the collar, moreover, there is a small drill-hole on either side. Karo assumes that a transverse pin was inserted here.<sup>104</sup> In the other holes a pin or another metal object might have been fastened.

That pins were already cut out of ivory in early times in Crete is established by an oblong cylindrical ivory fragment, 4.4 cm long, from Arkhanes (EM III-MM III).<sup>105</sup> The head is flat, the lower section has broken off. In light of the elongated elliptical form the end was probably pointy.

Thera has yielded two bone pins (LC I/LM IA). In each the upper part is polygonal in cross-section,<sup>106</sup> the rest apparently cylindrical. They taper for their entire length.

### Rosette

The showpiece among the ivories from Circle B is, in my view, the rosette R 1 (*fig. 10*), which is the only ivory found in Grave P. This rosette, cut with great care in high relief, has a flat underside without any trace of a means for fastening.<sup>107</sup> The 16 petals, each with a smaller inner petal and raised borders, bend slightly down away from the centre, with faintly S-curved surfaces. The slightly convex round heart is encircled by raised dots, resembling a string of beads, which are defined by transverse incisions. R 1 need not necessarily be an appliqué: perhaps it was simply a loose ornamental object.

Another loose, but more simply rendered ivory rosette comes from Thera (LC I/LM IA) when the island underwent strong cultural influence from Crete. The 12-petalled rosette, without inner petals, is illustrated (and mentioned), but not described by S. Marinatos.<sup>108</sup> In addition, Thera has yielded a green faience lid (LC I/LM IA)<sup>109</sup> adorned with a spreading rosette in relief which curves over the rounded surface. Of somewhat earlier date (MM IIIB) is the above-mentioned game board from the palace of Knossos. Made for a great part of ivory, it was, according to Evans, probably mounted on wood and simultaneously served as the lid of the box with the game pieces. Ivory rosettes of 16 petals are cut along the outer edge, their centres are convex discs of rock crystal.<sup>110</sup>

### Miscellaneous

The only recognizable fragment of X 1 is correctly supposed by Karo to belong to a vase.<sup>111</sup> It is hard to imagine that all the remaining fragments and chips were part of it as well, although the nature

of the other original object(s) remains unclear. Karo speaks of useless waste,<sup>112</sup> Poursat about shapeless fragments.<sup>113</sup> The shapes of the fragments are irregular and, with few exceptions, they do not fit together. Among them are two curving fragments which possibly belong to the handle of a vase and a fragment with a rectangular cut-out. The thickness of the fragments varies strongly; the surface generally shows a curve. In any event the fragments were apparently considered too valuable<sup>114</sup> to be discarded.

The vase fragment probably comes from the neck and includes part of a flat, circular rim below which a transversely notched band and a plain surface project. The rim is furnished with two diagonal, drilled peg-holes, evidently intended for fastening the lid.

According to Karo, the seven fragments X 6 might have belonged to dagger or sword hilts.<sup>115</sup> This is easy to envisage with regard to one fragment (4.0 x 2.8 cm) in particular. It has one straight, bevelled edge and shows a crosswise curvature and a pinhole (0.60-0.65 cm D.). Other fragments are slightly curving as well, some having a bevelled edge and, in one case, probably a partial pinhole. In two fragments part of an ample rectangular cutout can be seen, resembling the central cavity underneath a pommel.

Karo also assigns three other fragments inventoried under the same number in the Athens National Museum to dagger or sword hilts.<sup>116</sup> They are doubtless parts of a pommel, however, and are therefore catalogued here as Po 12. Two fragments form a flat plate of considerable thickness (max. 0.9 cm), with a round form (3.6-4.0 cm D.) and a large square opening in the middle (1.6 cm D.). On the side, where the halves fit together, two pinholes are placed face to face in the wall. Therefore we seem to be dealing with the lowest part of a shaftless pommel. The third fragment comes from the upper part of a pommel. The uppermost contour of the central cavity is visible on the bottom. As its diameter approximates that of the two preceding pieces, this ivory fragment probably belonged to the same pommel.

The form and function of the many undecorated fragments of X 7 are impossible to determine. With regard to X 8-13 matters are probably hardly clearer.

## 7 MOTIFS

A substantial minority among the Shaft Grave ivories (21 of the 76 catalogue entries) is decorated. Three of these ivories were found in Circle

B (N 1 and Pi 2 from Grave A, and Pl 5 from Grave O). Those from Circle A were recovered in Graves I, III, IV and V (4, 1, 9 and 4 entries, respectively).

A number of decorated ivories only show one or more straight lines only, which is not an especially notable motif (A 1, N 1, Pi 2, S 2, S 3, X 3, X 5). Ivories in which the forms of the object and the motif are closely linked have been discussed above (B 1 and R 1, from Graves V and P, respectively). The same applies to ivories with incisions which were perhaps not meant to be decorative (Ha 2 and X 2 from Grave IV). The remaining pieces bearing figured and abstract motifs are discussed below (C 1-2, Ha 4-5, Hi 1-3, Pl 5, Po 1-2, Py 1-4).

Various figured motifs are seen in C 1, Ha 4-5, Po 1 and Py 1-3. Florals adorn C 1 (bunches of three leaves, rosettes), Ha 4 (flowers, including lilies) and, perhaps, Hi 1 (rosettes). Marine motifs occur in Py 1 (sea) and Py 2 (sea, dolphin); lions in Ha 5 (lying lion between ledges) and Po 1 (four lions running). Other quadrupeds appear in C 1 (four more or less lying), Py 2 (one rearing) and Py 3 (two wings or horns). Py 3 also features a chariot.

The abstract motifs in C 1-2, Hi 1-3, Pl 5, Po 2, Py 1, 3 and 4 include straight and curved lines, wavy lines composed of S-hooks, spirals, zigzags, triangle, a meandroid with swastikas and rectangles with oblique hatching, a ladder-like construction and a tapering, indented form with a hatched ellipse inside. Some motifs occur on more than one ivory; for example, C 2, Py 1 and Py 3 have zigzags, C 1, Hi 1-2, Pl 5, Po 2, Py 1 and Py 4 various kinds of spirals.

### C 1

The heavily damaged comb C 1, which had flat relief carving with incised details on either side (*figs. 1, 2*), could have been only partly reconstructed if we had not been so fortunate as to recover the gold strips of facing laid over the florals and the animals, which furnish an imprint of them. In Crete, the practice of facing relief motifs with gold leaf is demonstrated by Minoan stone vases, like a libation vase from the palace of Zakro (MM III-LM I).<sup>117</sup> From Palaikastro comes in addition a gilt steatite seal (MM III-LM I).<sup>118</sup>

Strip *a* shows two stylized floral motifs, including some abstract elements. The whole has a strongly ornamental character. Wavy stems of S-hooks, each hook reflecting the adjacent one, run the full length of the frame. At the extremities the wavy line takes on a spiral form. Each S-curve

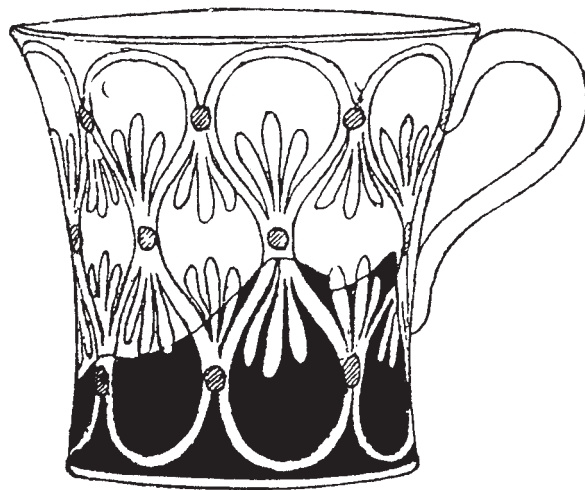
curls around a rosette. Where an S-hook ends and a new one begins we see a cluster of three tongue-shaped leaves, pendent on top, upright below.

Minoan art may have inspired the maker of the pattern. Wavy lines with deep curves occur in both the Middle and the Late Minoan periods; perhaps the motif derives from the running spiral.<sup>119</sup> A polychrome cup from Phylakopi (MM II), made in Knossos (*fig. 15*),<sup>120</sup> shows a pattern similar to that of C 1, although in a different variant. Instead of S-hooks, a chain of forms resembling figures-of-eight surrounds the cup. From the centre of each 8-form spring two mirrored clusters of three tongue-shaped leaves, one pendent, the other upright. Also in the spaces between the 8-forms, where the loops come closest to each other, we find such clusters, once again pendent above and upright below. S-hooks (connected by a diagonal line) curling around rosettes appear, for example, on a sealing (*fig. 16*) from Knossos (MM IA Deposit)<sup>121</sup> and in a stucco ceiling decoration in the palace of Knossos (LM IA).<sup>122</sup>

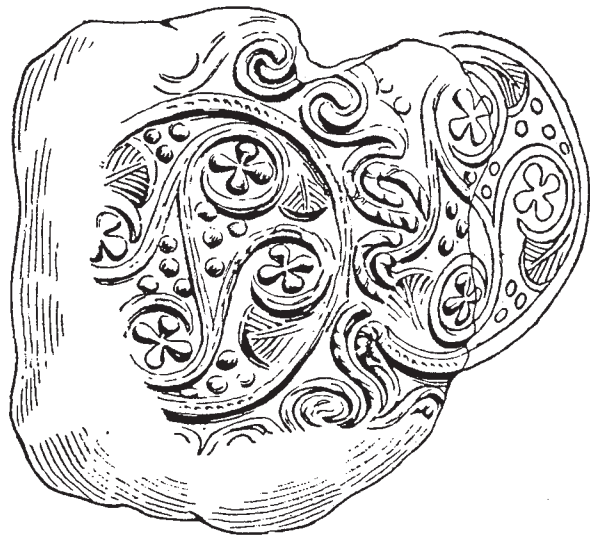
Strip *b* portrays a row of four quadrupeds more or less lying and turned towards the right. They have big, thick heads, two of which are turned round. The trunks of the central animals are covered with small spots. Another animal has a spotted tail shaped like a big plume; the plume shape is repeated in the two (?) other visible tails. The hind legs, positioned directly under the trunks, end in spirals denoting either claws or hoofs. One of the hind legs of the animal in the middle left is thrust far back in a peculiar manner, forcing the left foreleg of the animal on the extreme left tightly into the corner. On the whole, the bent, advanced forelegs are clumsily rendered; in the middle animals it is as if they are not really part of the body. The small size of the forelegs of the middle right animal suggests that the ivory-carver underestimated the amount of available space. The remaining space above the animals is for the most part filled in with ornaments.

What kind of animal is represented? Referring to the spiral claws, Karo took them for lions.<sup>123</sup> Vermeule sees lions in the unspotted animals only; both the spotted ones may be deer.<sup>124</sup> However, this interpretation overlooks the fact that the heads of all the animals are similar and that the tails bear a resemblance as well. While doubting they are lions, M. Ballintijn points out that, in spite of the clumsy rendering, the animals' postures would not be unnatural for a lion. If the spotted animals indeed represent lions, they could only be young lions, which would later lose their spots. Furthermore, she comments that

although the shape of the heads and the rather large, almond-shaped eyes could be compatible with lions, the absence of a mane, so conspicuously indicated in other depictions of lions from the Shaft Graves, is a significant sign. Moreover, the manner in which the legs are bent seems more appropriate for cattle than for lions, and the spirals, as remarked, could easily indicate hoofs.<sup>125</sup> In short, these quadrupeds bear a strong resemblance to lions, but not to the degree that they can be definitely identified as such. Since no other kind of animal seems to fit the description - for instance, cattle have a different type of tail, deer



*Fig. 15. Cup from Phylakopi. Evans I 1921, fig. 186e.*



*Fig. 16. Seal impression from Knossos. Evans I 1921, fig. 151.*

smaller heads - the only possible conclusion is that the maker was not successful in portraying the species he intended. Perhaps he had difficulty recalling the specific animal's overall appearance and combined, consciously or not, parts of different ones.

According to Vermeule, the representation bears a resemblance to 'nomad carving' in bone.<sup>126</sup> Karo sees in it a provincial echo of better, Minoan specimens.<sup>127</sup> Neither of them cites parallels, however. It is nevertheless clear that the animal decoration of C 1 is of poor quality and contrasts sharply with the skilled carving of Cretan Neo-Palace ivories.

If we accept that the same artisan made the decoration on each side, C 1 can be an example of the local Mycenaean adaptation of the Minoan repertoire by someone who lacked the fine craftsmanship of his Minoan counterparts. The carving, maybe the direct imitation, of a relatively simple, two-dimensional pattern as on side *a* was within his ability; he found it problematical, however, to depict something more lifelike and to create a suggestion of volume.

#### C 2

Under the gold plate covering, thus hidden from view, the top and back of the semi-circular comb C 2 are decorated with a pattern of zigzagging circles marked with central dots. On account of their black colour Karo thinks the pattern was burnt into the ivory.<sup>128</sup> Apparently the gold plate became available only after the completion of the comb. Moreover, someone may have had the idea to repeat the same or a similar unpretentious motif in the gold, for, as Poursat observes, it too shows a bit of a zigzag.<sup>129</sup>

The earliest Minoan ivories with a zigzag design are from Ayia Triadha: a seal (EM II-MM IA)<sup>130</sup> and a round biconvex disc with a central hole (EM II-MM II).<sup>131</sup> These incised zigzags, however, are the usual linear kind. In contrast, the C 2 zigzag of circles is, as far as I am aware, without parallel. From Shaft Grave IV also comes a flat, ring-like bone object in which a chain of dotted circles has been carved around the central opening.<sup>132</sup>

#### Ha 4

The incompletely preserved handle Ha 4 (*fig. 4*) is divided into diagonal, encircling friezes, alternately filled with a row of lilies and a row of flowers of a different kind. It is one of the most refined images on the extant Shaft Grave ivories.

In Karo's drawing<sup>133</sup> the extremities of the ends

of the lilies' stamens are drawn more or less circular. This is not a faithful rendering, however, as the ends of the stamens, in fact, resemble flat cushions.

Similar stylized lilies are frequently rendered in Minoan art, for instance on a jar from the Lily Vase Deposit in Knossos (MM III-LM IA)<sup>134</sup> and on the Lily Fresco from Amnisos (MM III-LM IA).<sup>135</sup> A Minoan ivory with this motif dates from LM IB: a plaque from house X in Palaikastro, on which the lilies appear to have been strewn by a human hand.<sup>136</sup> A fine specimen from Thera is the Lilies Painting in the West House at Akrotiri (LC I/LM IA).<sup>137</sup> Other examples on frescoes come from Rhodes (LM IA) and Melos (MM III-LM I). In the latter case the lilies are depicted as in Ha 4, individually and arranged in a frieze.<sup>138</sup> The same also applies to the lilies on an inlaid bronze dagger from Shaft Grave V at Mycenae.<sup>139</sup>

The other flowers of Ha 4 have corollas with petals radiating nearly horizontally and multiple stamens; the tops of the stamens are indicated by separate dots. Parallels are not available, though the sloppily painted flowers on a pottery fragment from Knossos (LM IA)<sup>140</sup> are remotely reminiscent.

#### Ha 5

An especially remarkable ivory from the Shaft Graves at Mycenae is Ha 5 (*fig. 5*). This mirror handle fragment shows a lying lion which has been carved in high relief with great skill. The lion is bordered above by a bipartite ledge, below by a tripartite one. The mane has been carefully incised, consisting of groups of flame-shaped forms which end in points and curve slightly. But it is not altogether clear how much of the lion is portrayed or what is actually being represented. Karo notes the preserved neck, head and foreleg of a recumbent lion turned to the right. Next to it there was perhaps a similar lion in reverse;<sup>141</sup> Karo's reconstruction drawing shows two such lions in side view with a shared frontal head.<sup>142</sup> In the preserved part of this head Poursat discerns a round ear and the scarcely visible contour of the snout; in addition, he mentions the mane and, below, a crumbled, rounded mass, perhaps a paw.<sup>143</sup>

Poursat objects to Karo's reconstruction as it implies that the lion had a counterpart. Moreover, the preserved lion in Karo's drawing appears too squat and, so to speak, is pressed between the ledges. Poursat advances the possibility that the lion is meant to be seen occupying a confined space which causes it to turn its head round towards its hindquarters (which are not pre-



served). The same posture can be seen on seals found in the Vapheio tholos. In this case, the hindquarters would have been in the mirror's missing right-hand part.<sup>144</sup> It is impossible to say whether Poursat's elaborate reconstruction might be correct, for as he remarks himself, the condition of the piece does not allow for a definite judgement.<sup>145</sup>

The mane has been rendered identically to the one in Po 1 (*fig. 7*). Flame-shaped manes also appear in a number of Middle and Late Minoan representations; for instance, a seal impression from the palace of Phaistos (MM II),<sup>146</sup> a stucco fragment from the palace of Knossos (MM III)<sup>147</sup> and a gold pendant from a grave near the villa of Ayia Triadha (LM I).<sup>148</sup> In Crete, as early as the EM III-MM IA period, we find the seal motif - carved in ivory - of two standing or walking lions which curl around the centre of the image while turning their heads.<sup>149</sup>

Like the lion, the ledges have been treated very precisely, too. The upper band of the tripartite ledge overhangs the middle one, and the middle one the lowest one; consequently, in frontal view the upper section is closest to the observer. The same applies to the lower bipartite ledge as well as to the ledges of B 1 and a strip of S 1.

The ledges of Ha 5, like those of B 1, are reminiscent of Minoan architectonic elements, for which see the discussion of B 1 in section 6.3.

### *Hi 1-3*

The inlaid gold patterns of ivory hilts Hi 1-3 probably extended over the entire surface, although regarding Hi 1 and 2 not much remains. Of Hi 3 (*fig. 6*), a more substantial part of the ivory has survived intact and, with it, also relatively more of the gold decoration.

The pattern of Hi 1, seen between three pinheads, consists of spirals, probably S-hooks, which, according to Karo, twist around rosettes.<sup>150</sup> The description is contradicted by Xenaki-Sakellariou, however, who sees no rosettes in the design. Nevertheless, her enlarged illustration of the patterned fragment still gives me the impression that the pattern includes rosettes of a very simple kind.<sup>151</sup> The decoration of S-hooks and rosettes is inlaid in the blade too.<sup>152</sup> The same combination of motifs recurs on side *a* of C 1 (*fig. 1*).

In Hi 2 we find the remnant of a gold pattern which is hard to discern, apparently consisting of spirals only.

Hi 3 (*fig. 6*) shows a meander-like pattern which delineate swastikas at the intersections. In

the intervening spaces there are solitary, hatched rectangles. Similar meandroids, although without swastikas and rectangles, are met on ivory seals from Early and Middle Minoan Crete.<sup>153</sup>

### *Pl 5*

The paired and curved lines decorating the fragments of plaque Pl 5 were part of a network executed in flat relief with long, spiral-shaped elements and triangular, curving interstices. It bears a strong resemblance to the incised pattern of Po 2, found in Shaft Grave IV, whereas Pl 5 comes from Shaft Grave O. (See further under Po 2 below.)

### *Po 1*

Po 1 (*fig. 7*) is decorated with four lions at a flying gallop arranged in a pinwheel composition: the slightly curving bodies fan out in an identical way over the surface of the pommel and the turned heads meet in the centre. The movement is further intensified by the extremely slender, elongated shape of the bodies. The stiffly extended tails also heighten the suggestion of speed.

The contrasting points of view - the heads are seen from above, the bodies from the side - is a clever artistic device because the spectator can observe the depicted parts only from different vantage points. Looking from above, the observer sees the lions' skulls and manes; from the side, their flanks.

At the time of the Shaft Graves the use of different points of view in the same representation is also found in frescoes in the House of the Frescoes in Knossos (LM IA)<sup>154</sup> and in the West House in Akrotiri on Thera (LC I/LM IA).<sup>155</sup>

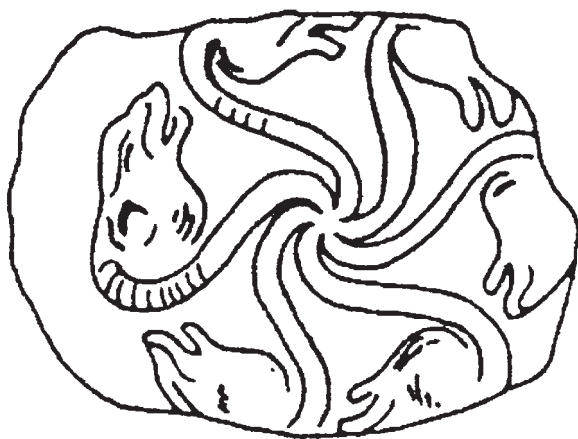
The earliest Aegean specimens of an animal at a flying gallop are from Crete; the oldest was found in the Phaistos Sealing Deposit (MM II). G. Walberg demonstrates how the seal-engravers of the Mallia workshop experimented with the theme.<sup>156</sup> Another early example is the head of an axe or sceptre in the shape of a leopard from the palace of Mallia (MM III).<sup>157</sup> The theme is employed in Minoan art for a long time. Although older specimens from the Near East are known (ca. 3000 BC),<sup>158</sup> there is, considering the great chronological difference, little reason to connect them.

A detail to which Poursat harks back repeatedly in his discussion of Po 1 is the stylized vein of the hind legs. It might be a thoroughly non-Minoan feature which originated in Near Eastern metalwork.<sup>159</sup> In my opinion, this detail may have penetrated through Crete to the artisans who manufactured the objects in the Shaft Graves.

Poursat even refers in a note to an ivory sphinx, from a house in Mallia, with a comparable stylisation.<sup>160</sup> This ivory sphinx, which according to J. Deshayes and A. Dessenne is of Egyptian origin, is dated by them to the early part of the 18th dynasty.<sup>161</sup> Hood assigns it instead to the 13th dynasty, around 1700,<sup>162</sup> and H. van Effenterre thinks that, at any rate, it was not made before 1800.<sup>163</sup> Deshayes and Dessenne compare the sphinx to sphinxes from the 13th dynasty and the Hyksos period.<sup>164</sup> Poursat observes that the veins of the latter sphinxes are more firmly stylized, while noting that the basic principle is clearly the same.<sup>165</sup>

The Mallia ivory is not the only known representation of a sphinx from Minoan Crete. Another one is seen on a seal from EM III-MM IA(-?), which has a typical Minoan seal motif on the underside.<sup>166</sup> And in the palace of Knossos an ivory wing fragment has come to light, which Evans has ascribed to a sphinx.<sup>167</sup> It is decorated with a spiral band and dated to MM IIIB. Therefore sphinxes may very well have been part of the Minoan ivory-cutter's repertoire, although the theme's ultimate origin lies in Egyptian and West Asian prototypes. In fact, the Mallia sphinx need not be imported at all.

The same rotating pattern of the lions of Po 1, which seem to whirl over the surface, was employed in many seal representations of Early and Middle Minoan Crete. Usually the whirling motif is abstract,<sup>168</sup> on one seal, however, it comprises the heads of sheep whose curved horns meet in the middle (*fig. 17*).<sup>169</sup> There is also a seal on which four dolphins or flying fishes are arranged in the manner identical to the lions of Po 1: their



*Fig. 17. Seal impression.*  
Yule 1981, pl. 6, motif 6, no. 1; CMS II 3, no. 75.

heads meet in the middle and their curving bodies spin out over the field. Between them, four small fishes are arranged accordingly.<sup>170</sup> True, this Knossan seal was unearthed in a grave of the Geometric Period, but Pini includes it in a list of seals which, on account of typological and stylistic characteristics, must be earlier than their contexts.<sup>171</sup> The whirling device can further be seen in Minoan pottery. On a cup or bowl from Phaistos (MM IIB) the device is applied to oblong, undulating leaves, the stems of which arise from a central circle.<sup>172</sup> Another motif in the standard repertoire of the Early and Middle Minoan seals consists of lions walking in circles.<sup>173</sup>

As a matter of fact, the decoration of Po 1 displays a very strong stylistic resemblance to a piece of gold plating belonging to the missing knob of a pommel which was also discovered in Shaft Grave IV. According to Karo, it is embossed work with engraved and imprinted details. Represented is a lion attacking a panther (?).<sup>174</sup> Here, too, the animals are adapted to a rotating composition. Once again, the animal bodies rendered in side view are strangely elongated; the heads, on the other hand, are seen in three-quarter view. The fore and hind legs (with indications of a tendon and vein, respectively), mane, head contour, ear, eyes and lion's snout are identical to those of the lions of Po 1. One difference is the indication of hair along the belly and the thigh, which is not included in Po 1.

Poursat describes the gold plating as the worked or embossed covering of a wooden pommel. He regards such pommels as the best evidence of the close relationship between ivory-carving and metalworking;<sup>175</sup> the representation of Po 1 might even be inspired by a metal prototype.<sup>176</sup> It is quite conceivable, however, that the technique of the gold-plate representation is analogous with that of comb C 1, that is, the gold plating was pressed over a core of more solid material in which the motif was engraved. It is doubtful, moreover, that the pommel consisted of wood; as apparently nothing is left,<sup>177</sup> it could just as well have been of ivory. Perhaps the latter is even more plausible, for the same hand most likely made the ornaments of both gold plating and pommel Po 1.<sup>178</sup>

#### *Po 2*

The incised dashed lines crossing the remaining surface of pommel Po 2 - each line parallel to at least one other, neighbouring line - strongly correspond, as previously stated, to those on plaque Pl 5. Above the pinhole, a triangular interstice

with concave sides is still visible. Although these lines create the impression of spanning the pommel like a net, the only visible trace of a hypothetical net is bordered by three parallel, in a sense straight, lines, as their seeming curvature results from the convexity of the surface. Considering the place of the lines in relation to the pinhole and its greater extent of surface curvature, these lines may have closed off the pattern at the bottom.

Possibly in Po 2, and maybe also in Pl 5, a net of so-called *Dreipässe* or *Vierpässe* is represented. Either motif can be found on Early and Middle Minoan seals.<sup>179</sup> A specimen of a *Vierpässe* net with triangular interstices occurs on the gold plating of a wooden box from Shaft Grave V.<sup>180</sup>

#### Py 1

Py 1 shows part of a representation whose subject is unclear. Identifiable elements on the right-hand side are zigzags and running spirals representing an undulating sea. To the left, a twisting outline denotes the lowest part of a curved shape which narrows downwards. Its incomplete extremity resembles half a tail fin, in which case it might be part of a sea creature. Another spiral is incised further to the left. It may run into the tapering, indented leaf-like shape next to it, in the middle of which is a hatched ellipse. The left-hand top corner of the fragment is filled with parts of curved lines and zigzags.

The remnants of the image on this pyxis fragment are in several respects reminiscent of the Marine Style of LM IB Crete. In the first place there are marine motifs like the sea itself and perhaps also sea vegetation. In the second place there is a sense of *horror vacui*. But the refinement of the Marine Style is lacking. The drawing looks fairly simple, in spite of the flowing lines, of which, for instance, the spirals are made. And the disciplined workmanship of the spirals is in itself, however, not indicative of especial artistic ability, as seen in C 1 with its oafish quadrupeds and carefully delineated spirals (figs. 1, 2).

The type of running spiral that in Py 1 represents seawater (defined in scholarship as a running S spiral or meander spiral) is also met in Late Middle Helladic pottery where, according to W.-D. Niemeier, it imitates Cretan or Cycladic models.<sup>181</sup>

#### Py 2

In Py 2 (fig. 8) a quadruped rises into the air above a dolphin, which is swiftly disappearing into the sea. In the background there is an elongated ver-

tical shape, possibly a column or the crosscut end of a wall.

The quadruped, of which most of the head, the entire breast and part of the feet are missing, is characterized by the marking of the belly with slanting lines, broad thighs, a short, pointed tail and a spotted coat, comparable to that of the animals in C 1 (fig. 2). A hoof is perhaps visible on the right foreleg. Presumably the creature is a deer. The animal rears up on its forked hind legs; the body is at an upward angle and the forelegs bent and, especially the right one, thrust forward.

Below the forelegs, the dolphin dives vertically into the sea; its heart-shaped tail fin and slightly bent body are still visible above the waves, which are triangular and placed next to and behind each other. The combination of a land animal and a fish might at first strike one as strange, although it is also found in representations on a seal from LC I Akrotiri (sphinx above a dolphin)<sup>182</sup> and a seal, possibly from LM/LH II-III A1, of unknown origin (bovine looking round above three dolphins).<sup>183</sup> Naturalistic representations of dolphins are known in Crete since the Old Palace Period.<sup>184</sup> L. Morgan points out that in pictures of dolphins from mainland Greece, on the other hand, the marine setting is omitted, apart from the Dendra Cup (LH II). Thus a dolphin in a marine setting may be a Minoan innovation.<sup>185</sup>

The elongated vertical shape, partly hidden behind the quadruped, is provided with transverse lines above and below. The long horizontal line across the top is probably part of a ladder-shaped crossbeam. In any event, we are clearly dealing with architectural elements. They give the impression of forming an open structure which gives a view of the sea. If so, the dolphin might be meant to occupy the background, perhaps acting as a kind of ideogram of the sea.<sup>186</sup> Such structures are depicted, for instance, in the Miniature Fresco from the West House in Akrotiri on Thera (LC I/LM IA).<sup>187</sup>

An unclear element is the curving line above the quadruped's head, rising to the top of the column-like object. Perhaps it is the outline of a horn.

The scene is not executed with much precision. The transverse lines of the column-like shape are not in strict alignment, the belly markings overlap the contour, one wave crosses the dolphin, and the picture's uppermost horizontal border is in fact composed of two lines which are not at exactly the same level. Nevertheless the quadruped is rendered with flowing lines and the whole gives an impression of liveliness. It seems possi-

ble that the theme generally goes back to Minoan models.

### Py 3

Poursat's supposition is correct that a chariot is represented in Py 3 (*fig. 9*).<sup>188</sup> Despite many scratches and much splintering, various parts are still distinguishable. Above a four-spoke wheel we can still see the back part of the rectangular car. It curves outwards and is adorned at the corner with a fanciful projection turned towards the front, which gives the impression of being a carefully woodcarved decoration along the back edge. Some diagonal hatching marks the top of the car's side, above which there is a bent arm which seems to emerge from a half-sleeve. The front part of the arm, only partly preserved, also shows diagonal hatching, as does the top of the sleeve. The thick curving draught-pole survives for the most part. Curved hatching suggests the pole's rounded form. Above the pole, traces of a construction resembling wooden rods are discernible. In front, at the top of the fragment's left-hand corner, a pair of pointy, tapering, curved forms with zigzags inside may portray either wings or horns.

The chariot is of the Box Type characterized by a rectangular car, four-spoked wheels and space for one or two passengers. The type is seen in most early Aegean representations of chariots; the earliest specimens come from Grave Circle A at Mycenae and are engraved on a gold signet ring from Shaft Grave IV and carved on at least one of the stelae found above Shaft Grave V.<sup>189</sup> J. Crouwel is of the opinion that the Box Chariot goes back to prototypes on Syrian cylinder seals from the 18th-17th centuries.<sup>190</sup>

A picture of a Box Chariot from Vapheio, dated LH IIA, shows a curving, perhaps even wavy, draught-pole which also has diagonal hatching which possibly indicates the rounding of the pole.<sup>191</sup>

In two known Aegean depictions chariots are drawn by goats with horns which have approximately the same form as the curving objects in Py 3. Both specimens are Cretan: an agate signet ring from Avdu (LM II-III A 1/2) and a limestone larnax from Ayia Triadha (LM IIIA); the goats are hitched to chariots with two passengers.<sup>192</sup> Despite the comparisons, it seems most likely that the curving forms of Py 3 represent not horns but wings. First, the ends curl less than the horns of the Cretan goats; second, the zigzag pattern seems more suitable to (flat) wings than to (cylindrical) horns. The draught animal before the chariot might therefore be a griffin.

The Mycenae chariot, which is as yet the earliest and only the second known depiction of a chariot on an Aegean Bronze Age ivory (the other coming from Cyprus),<sup>193</sup> is relatively coarsely executed, note for example the quality of the many hatched lines and the zigzags. On the other hand, the rendering of the carved wooden (?) decoration at the back of the car evidences an eye for detail.

### Py 4

The surfaces of most Py 4 fragments are very worn. A few fragments, however, preserve shreds of representations which can no longer be recognized. The most extensive remains consist of coarse linework. For instance, joining fragments bear a shakily executed, ladder-like transverse shape, next to which florid lines, more or less parallel, slant upwards, seemingly swaying.

A smaller remnant shows part of a notched shape with inner hatching. It is probably here that Poursat recognized a '*jupe à volants de personnage féminine*'.<sup>194</sup> In my view, however, too little has been preserved to be sure. If he is right, the shape may portray the edges of two flounces or a foot under the skirt's hem. In the latter case, the skirt would have a slightly upturned hem and the shoe a high, long instep and a blunt toe. The skirt is crosshatched, the shoe is marked with oblique hatching. A third angular incision, visible at the bottom, is perhaps the result of damage.

Another fragment, probably part of the upper edge, is crossed by a horizontal line, above which a neatly executed spiral passes into another spiral which is barely visible. The type of spiral is identical to that of the running spirals of Py 1.

## 8 EARLY IVORY-CARVING IN MAINLAND GREECE

### 8.1 Evidence for ivory-carving at Mycenae at the time of the Shaft Graves

Not all the ivory found in the Shaft Graves was worked. In his catalogue of objects from Circle A, Karo mentions extremities of elephant tusks: one specimen in Grave IV, several in Grave V. It is known that the former is cut off smoothly and has a length of 3.7 cm. Karo called these extremities of tusks unusable waste, whereas Krzyszkowska labelled them awkward bits, which remained as waste after the carving of pommels. In any event, they are clear evidence that ivory-carving was executed in Mycenae itself. Moreover, that the pieces of tusks were thought worthy of being funerary gifts is linked, according to them, with the material's costliness.<sup>195</sup>



## 8.2 Ivories from LH IIA contexts

Early Greek mainland ivories, other than those from the Shaft Graves, belong to LH IIA contexts and thus date back to just after the Shaft Grave Period, although there is a slight overlap in Grave I where the pyxis fragments Py 1-4 were found (see section 3). The early mainland ivories were recovered in Kakovatos (tholos A), Pylos (Routsi, tholos 2), Vapheio (tholos), Thorikos (tholos 2) and Mycenae (Cyclopean Tomb, Tomb of Aegisthus).<sup>196</sup> What immediately strikes the observer is that all the ivories belonged to types of burial reserved for notables, and that the sites are scattered over the Peloponnesus and Attica (Thorikos).

Thorikos and the Cyclopean Tomb at Mycenae have yielded only a pyxis (high type) and fragments of a rod. In the Tomb of Aegisthus fragments were discovered belonging to strips (undecorated), dog's-tooth inlay and an unknown object. The group of ivories from Vapheio comprises a small plaque (with central hole), a large plaque fragment and two fragments of semi-cylindrical strips. With respect to content the group from Routsi has more to offer: two pyxides (high and thin-walled types), a comb (*peigne à corne*) and a mirror handle (palm leaf type). The ivories from Kakovatos are most numerous, including parts of two combs (one of which is a *peigne à corne*), fragments of two circular discs, a so-called candlestick (normal type), a pommel, fragments of two plaques, an incompletely preserved rosette (flat specimen with a pinhole in the smooth side edge and a trace of a mortise for a dovetail in the back) and fragments including semi-cylindrical strips.

Regarding categories, the ivories from Vapheio and the Tomb of Aegisthus appear to consist of inlay and appliqué pieces, those from Routsi and Thorikos, of toilet articles, and those from Kakovatos, of the preceding categories as well as a small pommel. It is highly remarkable that weapons, so amply represented among the Shaft Grave ivories, are almost lacking in these burials.

Comparable objects belong to other groups from other sites including a *peigne à corne* (Kakovatos, Routsi), plaque (Kakovatos, Vapheio) and strip with convex top marked by transverse notches (Kakovatos, Vapheio; somewhat similarly at Routsi, carved as a frieze frame on a pyxis). An ivory object found in both Routsi and Thorikos is the high type of pyxis. All these categories are, with the exception of the last one, attested in the Shaft Graves (C 4, Pl 1-5, S 2, respectively), as are the

thin-walled pyxis (Py 1-4), pommel (Po 1-25), rosette (R 1) and undecorated strip (S 4). The Kakovatos rosette is much more simply executed than the one from Shaft Grave P, although the number of petals is the same and the heart is similarly edged. The Kakovatos pommel differs from the Shaft Grave specimens by its long shaft.

The categories of ivories that are without parallel in the Shaft Graves include mirror handle of the palm leaf type, high pyxis, 'candlestick' and engraved discs. In contrast, the Shaft Graves contained a mirror handle of different appearance (Ha 5), thin-walled pyxides (Py 1-4) and a perforated round disc (D 1).

The vast majority of LH IIA ivories are decorated, that is, either engraved or carved in relief. The motifs can be divided into vegetal ('waz-lilies', both loose and in garlands, rosettes, palm leaf, foliate band), marine (shells, snails, dolphins swimming in the sea), animals (besides dolphin and snails, bull with turned head, cats leaping upon ducks in a rocky landscape, lions in a heraldic attitude?), religious-symbolic (?) (figure-of-eight shields) and abstract (running spirals, pattern composed of unrolling spirals, series of S-hooks with a slanting transverse connection, spiral composed of spotted parts whose halves mirror each other, chevrons, 'strings of pearls' and series of straight or curving lines transversely intersecting either a relief band or a bulging surface).

Common motifs of the two most important groups - Kakovatos and Routsi - are running spiral, 'string of pearls' and rosette (in Kakovatos as an appliqué). The running spiral is further seen on the Thorikos pyxis, which also has the shell motif in common with the Kakovatos group. Of these motifs, the running spiral and the rosette recur on some Shaft Grave ivories. Pommel decoration, seen at Kakovatos, is attested in the Shaft Graves only in Po 1 and Po 2.

In the Kakovatos group and the Thorikos pyxis the decoration has a purely ornamental character. Whereas the Routsi group, in which the ornamental also plays an important part, shows two of the liveliest scenes of LH IIA ivories, namely, those in which animals have an active role.<sup>197</sup> Two engraved ivories, a comb and a pyxis fragment bear, respectively, a high-quality portrayal of cats attacking ducks and a fairly simple scene of dolphins swimming next to and behind each other. In each instance the background is slightly hollowed out.

The following conclusions seem to me inescapable. A clear typological affinity links the

various groups of ivories from LH IIA. Also, in spite of the small size of each group - only Kakovatos stands out numerically - some similarity is discernible in the use of decorative motifs. The affinities with the Shaft Grave ivories, however great, concern mainly the typological repertoire. The tendency to decorate ivories, which becomes apparent in Circle A at Mycenae, continues into LH IIA when, however, there is no evidence for the application of gold, as seen on some ivories from the Shaft Graves III-V (see section 4). A common feature of most decoration on ivories from LH IIA is the *horror vacui*, a phenomenon which is earlier seen on ivories from the Shaft Graves (C 1, Hi 3, Po 2, Pl 5, Py 1).

## 9 CONCLUSION

The ivories from the Shaft Graves of Mycenae (MH III-early LH IIA) are the oldest of the Greek mainland. Other early mainland ivories were made directly after the Shaft Grave period (LH IIA context), although they chronologically overlap Shaft Grave I somewhat. They were found in tholos graves in the Peloponnese and Attica.

For the greater part, the Shaft Grave ivories can be divided into three categories. In the first place, they embellish weapons (swords, daggers, knives). Next, the ivories were used for the manufacture of toilet articles (combs, mirror handles, pyxides) and, lastly, as inlays and appliqués for wooden objects. The most common ivory object found is the pommel, belonging to swords and daggers. As a matter of fact, ivory weapon parts constitute nearly half of all the Shaft Grave ivories.

A category of Aegean ivories whose origin has now become clearer comprises the combs. C 1 and 3, for example, can be regarded as predecessors of the *peigne à rosette* (LM IB; LH II-III). C 2, a comb for fastening a woman's hair, is both a unique variant and a predecessor of the *peigne de coiffure*, which is only known from mainland Greece.

Several Shaft Grave ivories (21 of the 76 catalogue entries) are decorated, often with simple patterns like straight lines, zigzags and spirals. The representations include floral and marine motifs, lions and other quadrupeds, as well as the earliest of our only two known portrayals of chariots on ivories of the Aegean Bronze Age.

To a degree, relatively more ivory was recovered from graves which contained generally richer burial gifts. Thus the greatest amounts came to light in two of the richest Shaft Graves: IV and V. On the other hand, Shaft Grave III,

which is also among the richest, yielded a single specimen only: a comb. Owing to the absence of weapons or armour, it is assumed that adult males were not buried in this grave.

Few ivories can be assigned to an individual burial within a grave. Sometimes, however, the gender of the deceased can be inferred from the nature of the gift. Grave I, known as a woman's grave, and Grave III, just mentioned, had fragments of ivory pyxides and a gold-covered ivory comb, respectively. Besides ivory fragments, the specifically male graves (II, VI, Z, N) had ivory weapon parts and a fragment of an ivory vase.

Poursat summarizes his view of the earliest Mycenaean ivory-carving as follows: '*À sa naissance, l'art des ivoires est un art sans traditions: il ne dérive ni de l'art des ivoires minoens, ni des groupes orientaux. Il s'inspire des autres arts du relief, glyptique ou métal, utilise comme eux des traits minoens et des traits orientaux, subira peut-être, dans la catégorie des objets de toilette, une influence, directe ou indirecte, de l'Égypte.*'<sup>198</sup> In other words, Mycenaean ivory-carving was an outsider among Mycenaean crafts, an '*art qui doit inventer ses propres formes décoratives*'.<sup>199</sup>

However, Poursat's opinion is questioned by Krzyszkowska: '...it is hard to see the nascent Mycenaean craft arising in complete isolation from its Minoan counterpart.'<sup>200</sup>

Although Poursat closely concerned himself with the development of Mycenaean ivory-carving, he paid comparatively little attention to the Shaft Grave ivories. In *Les ivoires mycéniens* he mentions B 1, C 4, Ha 4, Ha 5, Po 1, Po 2, Po 8, Py 1-4 and R 1. Much attention is given to B 1, Ha 4 and, especially, Ha 5 and Po 1, whereas all the others are only enumerated in lists of shapes and motifs.<sup>201</sup> With regard to Ha 5 (fig. 5) he observes that this mirror handle, because of its decorative spirit, radically differs from later Mycenaean specimens. In reference to the animal theme on an ivory cornice which is demonstrably assignable to B 1 he refers to Schweitzer who, in Poursat's view, had quite accurately shown the motif's Egyptian origin.<sup>202</sup> According to Poursat, furthermore, the floral decoration of Ha 4 (fig. 4) is directly connected to the naturalistic Minoan tradition.<sup>203</sup> In relation to Po 1 (fig. 7) he emphasizes the presence of a vein on the lions' hind legs, a stylistic detail which may be borrowed from Near Eastern representations.<sup>204</sup> Lastly, he sees Minoan influence in the flying gallop of these animals.<sup>205</sup>

With respect to quality, the Shaft Grave ivories vary greatly. Most of them are simple in shape

and, if decorated at all, show basic motifs. In contrast, a small minority of ivories, like Ha 4, Ha 5, Po 1 and R 1, differ by their extreme refinement. They breathe a Minoan spirit and go back, with regard to shape or decoration, to Minoan examples. Their workmanship betrays a degree of skill which seems compatible only with a tradition of ivory-carving in a highly developed phase: at the time of the Shaft Graves such a tradition existed undoubtedly in Crete, not on the Greek mainland.

In the Shaft Graves, the abundance of ivories of simpler kinds, the limited number of types and the unpractised craftsmanship clearly visible in some ivories (quadrupeds on side *b* of C 1, ornamental motifs of C 2, D 1, Hi 6, decoration of some pyxis fragments) indicate that during the period of the Shaft Graves the craft of ivory-carving at Mycenae took place on a comparatively modest level. That ivory was worked at Mycenae itself seems evident from the remnants of elephant tusks discovered in Graves IV and V. The simpler ivories must for the greater part have been the work of inexperienced hands, that is, local ivory-carvers, who were evidently inspired by Minoan models. Minoan influence is seen in the conception and, in part, the technique: the combination of ivory and gold (C 1-3, Hi 1-3), forms (ledges of B 1, Pl 2, pommels?, one specimen of S 1, S 2) and motifs (side *a* of C 1, Hi 1, Hi 3?, Pl 5, Po 2, Py 2?). A native Mycenaean style cannot readily be perceived, unless one might characterize it as simplified and Minoanizing. The floral decoration on side *a* of comb C 1 is a good example of a borrowing from the Minoan repertoire by a local Mycenaean artist who, in comparison with his Cretan counterparts, was lacking in artistic ability, as is evident from his animal decoration on side *b*.

However, a modified picture emerges in a comparison of the ivories from Circle A, which were not given to the dead before LH I (= ripe LM IA), with those from the largely older Circle B, which were probably not interred, for the most part, before the close of MH (= early LM IA). The work becomes somewhat more complex, although simplicity does not entirely vanish in the least. A greater richness of shapes arises and the addition of decoration becomes the rule rather than the exception, apart from the pommels. Moreover, it is striking that the Minoan elements, which are earlier scantily seen (Pl 5, R 1), come strongly to the fore at the time of Circle A. After a monotonous beginning, in which especially ivory pommels were made, the Mycenaean ivory-carvers begin to explore the possibilities of their craft

through the medium of Cretan products.

In summary, this study of the ivories from the Mycenaean Shaft Graves, objects which find no predecessors in mainland Greece, shows that the art of Mycenaean ivory-carving was then still in its infancy and drew heavily on Minoan Crete. Some high-quality pieces fit unequivocally into the Minoan artistic tradition and must therefore have been carved by craftsmen trained in Crete. At the time of the Shaft Graves a strong Cretan stimulus largely determined the use of ivory on the mainland.

#### APPENDIX 1

##### *Fragment of an ivory plaque, found between Shaft Graves A, Δ, and P*

A fragment of an ivory plaque, dated LH II, was found between Shaft Graves A, Δ, and P; it probably lay originally in Grave P.<sup>206</sup> The dimensions are 6.4 cm long, 4.0 or 4.1 cm wide and, at most, 0.6 cm thick. Diamond forms were scratched on the back,<sup>207</sup> probably to absorb glue (cf. Pl 5; see section 6.3). The fragment apparently belongs to the plaque's lower part, as the picture field is bound by part of a projecting border at the bottom (not in Pl 5).

The representation, carved in high relief, is described by Mylonas as a bullfight or bull hunt.<sup>208</sup> From left to right are shown, in side view, a big part of the (damaged) head and the bent arm of a man, apparently lying on the ground, below a jumping bull of which only the forelegs, hovering in the air, remain. In front of the bull the stretched leg of a man, who runs or jumps aside, is visible. On the right, the end of his hanging belt may be depicted.<sup>209</sup>

Underneath one can see an upright sword with a globular pommel. The sword is partly hidden behind a finely worked piece of textile or carpet which is draped in the same way as the scarf tied in a bow referred to as the sacral knot.<sup>210</sup> As a rule, the sacral knot is tied in a piece of fringed textile, depicted so that the knot's loops and both fringed ends of the scarf are visible. A highly stylized version of the motif appears on this plaque; the knot, loops and one fringed end have been omitted.

The sacral knot is a common motif in the Aegean world. Faience specimens<sup>211</sup> were found, for instance, in Shaft Grave IV and an ivory example (LM I)<sup>212</sup> has turned up in the South-east House at Knossos. The well-known *Parisienne*<sup>213</sup> in a painting from the Knossos palace (LM IIIA) wears the sacral knot on the back of her shoul-

ders. More commonly, however, the knot is seen in combination with a double axe, as on an ivory plaque from Palaikastro (LM IB).<sup>214</sup> In conjunction with a sword, it is definitely known to occur earlier only once: a Minoan double axe of bronze, probably from Voros (MM III-LM I).<sup>215</sup>

A striking feature of the man on the plaque is the gesture of his hand: seen from the back, it is stretched down and the extended thumb stands at a wide angle to the tightly joined fingers. This is the gesture of Minoan bull-jumpers while floating in the air, if we judge from a fresco fragment and the remains of some ivory figurines (MM IIIB) from Knossos which have been interpreted as such by Evans.<sup>216</sup> In the well-known Toreador Fresco (LM II-III A)<sup>217</sup> from Knossos, however, it is not the bull-jumper but one of the minor female figures that makes the same gesture.

The plaque fragment has been carved with

great skill. The leg, rendered in the most faithful and careful way possible, puts the craftsmanship on a par with that of the just-mentioned ivory bull-jumpers from Knossos (MM IIIB)<sup>218</sup> and the ivory Palaikastro Kouros (LM IB context).<sup>219</sup> One can note, for instance, the extensors of the upper leg, the patella, the bone in the foot, and the curve of the thigh and calf.

The dating of the plaque fragment to LH II implies that it comes from the later chamber tomb built within Grave P. It seems clear, however, that an attribution to the original Shaft Grave, which has also yielded the refined ivory R 1 (*fig. 10*), is not any less likely. However that may be, the artisan who carved the plaque was well-informed about Minoan representations and had command of a fabulous technique: it seems hardly possible that he was not the product of the Cretan school of ivory-carvers.

## APPENDIX II

### *Inventory of graves*

grave	catalogue code	description of object	decoration	inv. number ANM
I	Py 1	Pyxis: frags.	marine motifs	210
	Py 2	Pyxis: frag.	rearing quadruped, dolphin	210
	Py 3	Pyxis: frag.	chariot, wings or horns	210
	Py 4	Pyxides: frags.	abstract motifs	210
II	Ha 1	Bronze knife with ivory handle		216a
	X 1	Dozens of frags., including one vase frag.		226
III	C 1	Comb: strips of gold facing and ivory frags.	a: wavy stems of S-curves, three-leaved groups, rosettes. b: lying quadrupeds	109
IV	A 1	Attachment (?)	transverse lines	507d
	C 2	Comb with gold-plated frame	zigzag of circles with central dots	310
	Ha 2	Bronze blade with ivory handle: frag.	dots around pinholes	422a
	Ha 3	Bronze blade with ivory handle: frag.		422b
	Ha 4	Handle: frag.	flowers, including lilies	550b
	Hi 1	Bronze dagger with ivory hilt	inlay: pattern of gold spirals and rosettes (?)	396
	Hi 2	Bronze dagger with frag. of ivory hilt	inlay: pattern of gold spirals	397
	Hi 3	Bronze sword (type B) with ivory hilt	inlay: gold meander-like pattern of swastikas and hatched rectangles	435
	Pi 1	Pinhead (?)		507c



	Po 1	Sword pommel: three frags.	pinwheel arrangement of four running lions	295b
	Po 2	Pommel: frag.	pattern (?) of groups of parallel wavy lines defining void triangles with curving sides	550a
	Po 3	Pommel		490
	Po 4	Pommel: frag(s).		490
	Po 5	Pommel: frag(s).		490
	S 1	Four strips		575
	X 2	Five button-shaped objects	dots, some connected by lines	507a
	X 3	Knob-shaped object	surrounded by horizontal line	507b
V	B 1	Wooden box with ivory and wooden inlays and appliqués and frags.	bipartite ledges, squares	812
	C 3	Comb with gold-plate covering		654
	Ha 5	Mirror handle: frag.	lying lion, double and triple ledges	785
	Hi 4	Bronze dagger with remnants of ivory hilt		737
	Pl 1	Frag. of plaques with pinholes		835-837, 841
	Pl 2	Five D plaques		893
	Po 6	Pommel		775
	Po 7	Pommel		776
	Po 8	Pommel: slice		777
	Po 9	Part of a sword pommel		834
	Po 10	Pommel		837
	S 2	Seven strips and nine frags.	transverse grooves on top	819, 897
	S 3	Four strips (two incomplete) and frag.	transverse grooves on top	896
	X 4	Three appliqués and frag.		894
	X 5	Two appliqués	transverse grooves on top	895
VI	Hi 5	Alabaster dagger pommel with remnants of ivory hilt		908
	Hi 6	Bronze dagger with ivory hilt		927
	Po 11	Upper part of pommel		936
	Po 12	Pommel (three frags.)		937
	X 6	Seven frags. (of hilts and pommels?)		937
A	N 1	Needle: frag.	surrounded by horizontal lines	9579
	Pi 2	Pin (?): frag.	surrounded by horizontal lines	9579
	Pl 3	Six plaques (four fragmentary)		8560, 9579
Γ	C 4	Comb		8702
	D 1	Disc		9664
	Pl 4	Two frags. of plaques		9631
	Po 13	Pommel		9185
	Po 14	Pommel		9186
Δ	Ha 6	Knife handle		9567
	Po 15	Sword pommel		8710
	Po 16	Pommel: slice		8710
	X 7	Dozens of frags.		9609

Z	Po 17	Pommel		8666
I	Ha 7	Bronze knife with rock crystal pommel and traces of ivory handle		8617
	Po 18	Pommel		9187
	Po 19	Pommel		9606
	X 8	Frag(s).		9645
Λ	Po 20	Pommel		9584
	X 9	Frag(s).		9626
N	Po 21	Pommel: frags.		9600
	Po 22	Pommel		9654
	X 10	Frag(s).		9616
	X 11	Frag(s).		9633
	X 12	Frag(s).		9640
	X 13	Frag(s).		9657
O	C 5	Comb (?): frags.		?
	Pl 5	Plaque: 62 frags.	pattern of void triangles with curving sides	9570
	Po 23	Pommel: frags.		9571
	S 4	Strips: 28 pieces, mostly frags.		9570
P	R 1	Rosette		9188
?	Po 24	Pommel		9561
	Po 25	Pommel: slice		9561

#### NOTES

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- <sup>1</sup> Two probably imported ivories, a leg and a lid from Lerna, are older. Krzyszkowska 1988, 230, n. 71.
- <sup>2</sup> The ivories are indicated with a code which is explained at the beginning of the catalogue (section 2).
- <sup>3</sup> Graziadio 1988, 372.
- <sup>4</sup> Graziadio 1988, 343-372.
- <sup>5</sup> Graziadio 1988, 369.
- <sup>6</sup> Graziadio 1988, 343.
- <sup>7</sup> Dickinson 1977, 29.
- <sup>8</sup> Graziadio 1988, table 5.
- <sup>9</sup> Graziadio 1988, table 5.
- <sup>10</sup> Graziadio 1988, 372; see Dickinson 1977, 51.
- <sup>11</sup> Dickinson 1977, 50.
- <sup>12</sup> Krzyszkowska 1988, 212.
- <sup>13</sup> Krzyszkowska 1988, 214; according to 213, the two

pairs of lower incisors and the pair of lower canines, which are the most useful for carving, are entirely covered with cementum.

- <sup>14</sup> Krzyszkowska 1984, 124.
- <sup>15</sup> Krzyszkowska 1988, 214.
- <sup>16</sup> Ritchie 1969, 44.
- <sup>17</sup> Hood 1978, 131, 145.
- <sup>18</sup> Evely 1985, 156.
- <sup>19</sup> Evely 1985, 156: 'Though ivory constitutes the main substance being worked, there is also clear evidence for the handling of bone, horn and boar's tusk.'
- <sup>20</sup> Barnett 1982, 11.
- <sup>21</sup> Evely 1992, 7, fig. 1b.
- <sup>22</sup> Sakellarakis 1979, 106. See also Evely 1992, 8-9.
- <sup>23</sup> Sakellarakis 1979, 106, figs. 36 resp. 43, 61-63.
- <sup>24</sup> Xenaki-Sakellariou 1988, 39.
- <sup>25</sup> Evans II 1928, 272-273, figs. 162-163.
- <sup>26</sup> Levi 1952-54, 408, fig. 36.
- <sup>27</sup> Evans III 1930, 429, 432.
- <sup>28</sup> Evans I 1921, 387-388, 472, figs. 338-340, col. pl. V.
- <sup>29</sup> Moak 2000, 74.
- <sup>30</sup> Krzyszkowska 1984, 123-125; Krzyszkowska 1988, 209-234.
- <sup>31</sup> Miller 1986, 29-43.
- <sup>32</sup> *The Encyclopaedia of Mammals* 2, London, 1984, 506.
- <sup>33</sup> *Lexikon der Ägyptologie* 28, Wiesbaden 1981, entry 'Nilpferd'.
- <sup>34</sup> Haas 1953, 30-34.
- <sup>35</sup> Krzyszkowska 1988, 223, 231. For recognizing ivory and distinguishing varieties, see Krzyszkowska 1990.

- <sup>36</sup> Karo 1930-33, no. 216a.
- <sup>37</sup> Mylonas 1973, pl. 71b.
- <sup>38</sup> Mylonas 1973, 419.
- <sup>39</sup> According to Karo (1930-33, 100, pl. XCIX), ANM 408 (Shaft Grave IV), which comprises the fragments of a bronze sword hilt with gold-plated pinheads, includes ivory remnants with an inlaid pattern of gold spirals. In the Athens National Museum, however, I was unable to confirm the presence of ivory or gold spirals. Similarly, ANM 779 (Shaft Grave V), the fragments of the bronze hilt of a dagger or sword, with gold-plated pinheads and remnants of gold spirals, is noted by Karo in a list of ivory objects (319, n. 3), although ivory is not mentioned in his catalogue (142, pl. XCIX). In this instance, too, I could not confirm his observation. Neither hilt is listed in my catalogue.
- <sup>40</sup> Dickinson considers it a hilt of the so-called razor type rather than a dagger hilt (Dickinson 1977, 118: n. 17 of Ch. V 2). In my opinion, however, the relation between the length and the width (22.7:4.1 cm) and the presence of a distinct tip argue against this interpretation (see also Dickinson 1977, 68).
- <sup>41</sup> Karo 1930-33, no. 737.
- <sup>42</sup> Karo 1930-33, no. 435.
- <sup>43</sup> Karo 1930-33, 203.
- <sup>44</sup> Evans II 1928, 272-273, figs. 162-163.
- <sup>45</sup> Karo 1930-33, 203-204.
- <sup>46</sup> For references, see cat. nos. Po 1-12.
- <sup>47</sup> Karo 1930-33, no. 295b.
- <sup>48</sup> Mylonas 1973, 418-419, 423.
- <sup>49</sup> Sakellarakis, I. and E. 1997, 740-741, pl. 870.
- <sup>50</sup> Xanthoudides 1924, 123, pl. LVIII, nos. 224-226.
- <sup>51</sup> Mylonas 1973, 78, no. 508, pl. 61b (r.).
- <sup>52</sup> Evely 1984, 241, pls. 220: 1, 2; 230: 1.
- <sup>53</sup> Mylonas 1973, 189, 349.
- <sup>54</sup> Poursat 1977b, 23-24. The comb from Palaikastro (p. 23, no. 23) is illustrated in pl. IX: 1, 2; Dawkins 1923, fig. 108; and Evans IV 1935, fig. 956.
- <sup>55</sup> Poursat 1977b, 24.
- <sup>56</sup> Karo 1930-33, nos. 292-293, fig. 19, pl. XLV (one strip of no. 292 shows a representation of spirals); Sakellarakis 1979, 69, n. 226.
- <sup>57</sup> A *peigne à rosette* from the Temple Tomb at Knossos, dated LM II(-IIIA?), has a damaged protuberance which certainly did not represent a rosette. Evans (IV 1935, 1005, fig. 955) took it for a curved foliate spray.
- <sup>58</sup> Poursat 1977b, 39; Poursat 1977a, 11 (pl. II: no. 13), 79 (pl. XXIII: no. 268).
- <sup>59</sup> Karo 1930-33, no. 310, pl. XLIII.
- <sup>60</sup> Hood 1978, 122.
- <sup>61</sup> Hood 1978, 258, n. 58.
- <sup>62</sup> Karo 1930-33, no. 310.
- <sup>63</sup> Schäfer 1958, 81-82.
- <sup>64</sup> Herakleion Museum nos. 1, 172, 352. See Poursat 1977b, 19, pl. XI: 4, and Evans 1906, 63, fig. 69, respectively. Mirror handle from Arkhanes (LM II-IIIA): Sakellarakis, I. and E. 1997, 731-733, pls. 853-856. Two other specimens from Arkhanes (LM IIIA) and Knossos (LM II-IIIA) are mentioned in Sakellarakis, I. 1972, 404, and Evans 1906, 45.
- <sup>65</sup> Karo 1930-33, no. 210.
- <sup>66</sup> Poursat 1977b, 25-26.
- <sup>67</sup> Poursat 1977a, nos. 492 and 408 respectively.
- <sup>68</sup> Rutkowski 1981, 56, 58, 60, 62, 72, 84, 124, pl. 6, 2.
- <sup>69</sup> Alexiou 1967, 55-56, 71-75, pls. 30-33.
- <sup>70</sup> Sakellarakis, I. 1972, 406, fig. 12.
- <sup>71</sup> As the ivory-covered wooden object has been preserved and the ivory pieces include plaques as well as strips, I classify them as 'facings of a box' instead of as 'plaques' and 'strips'.
- <sup>72</sup> Schweitzer 1930, 113-114.
- <sup>73</sup> Schweitzer 1930, 116-118, figs. 2-4.
- <sup>74</sup> Poursat 1977b, 20.
- <sup>75</sup> Vermeule 1975, 20, n. 34.
- <sup>76</sup> Karo 1930-33, 246; he refers to Evans I 1921, 512, fig. 368.
- <sup>77</sup> See for instance Evans II 1928, fig. 326.
- <sup>78</sup> Kantor 1960, 15.
- <sup>79</sup> Persson 1942, 181, fig. 131, 2.
- <sup>80</sup> Hood 1978, 115, 257, n. 115.
- <sup>81</sup> Davaras 1973, 588-589; Krzyszkowska 1988, 217.
- <sup>82</sup> Mylonas 1973, 79, no. 511.
- <sup>83</sup> Poursat 1977a, sub no. 230.
- <sup>84</sup> Mylonas 1973, 207, no. 520; Poursat 1977a, no. 237, estimates the width as c. 5 cm.
- <sup>85</sup> Karo 1930-33, no. 836.
- <sup>86</sup> Karo 1930-33, no. 893.
- <sup>87</sup> Sakellarakis 1979, 112, figs. 88-91.
- <sup>88</sup> Evely 1985, 156.
- <sup>89</sup> Sakellarakis 1979, 95, 112.
- <sup>90</sup> Krzyszkowska 1988, 219, 221.
- <sup>91</sup> Schweitzer 1930, 109.
- <sup>92</sup> Karo 1930-33, no. 812.
- <sup>93</sup> Evans I 1921, 472, 474, figs. 339-340, col. pl. V.
- <sup>94</sup> Pernier 1935, fig. 129 (r.).
- <sup>95</sup> Dawkins 1923, 128, fig. 111b; dating: Hood 1978, 258, n. 44.
- <sup>96</sup> Demargne 1945, 57, pl. LXVIII, 1.
- <sup>97</sup> Karo calls them very modest counterparts of ivory game pieces from Knossos (Karo 1930-33, 244-245). The latter cannot serve as parallels, however: they are more or less conical and have different, more elaborate incisions (see Evans I 1921, 478, fig. 342).
- <sup>98</sup> Krzyszkowska 1988, 222-223; Karo 1930-33, nos. 894-895.
- <sup>99</sup> CMS II 1, nos. 15, 79, 143.
- <sup>100</sup> Evans III 1930, 408, fig. 271.
- <sup>101</sup> Karo 1930-33, 213, nos. 260-261, 507d, 826.
- <sup>102</sup> Mylonas 1973, 33, no. 507, pl. 22a.
- <sup>103</sup> Mylonas 1973, 33, no. 507, pl. 22a.
- <sup>104</sup> Karo 1930-33, no. 507c.
- <sup>105</sup> Sakellarakis 1974, 335-336, pl. 284b.
- <sup>106</sup> Marinatos 1974, 34, pl. 84c.
- <sup>107</sup> Mylonas 1973, 225, no. 522; Poursat 1977a, no. 239.
- <sup>108</sup> Marinatos 1974, 34, pl. 84c.
- <sup>109</sup> Marinatos 1976, 31-32, pl. 55b.
- <sup>110</sup> Evans I 1921, 387, 473, fig. 338, col. pl. V.
- <sup>111</sup> Karo 1930-33, no. 226.
- <sup>112</sup> Karo 1930-33, no. 226.
- <sup>113</sup> Poursat 1977a, no. 207.
- <sup>114</sup> See also section 8.1.
- <sup>115</sup> Karo 1930-33, no. 937.
- <sup>116</sup> Karo 1930-33, no. 937.
- <sup>117</sup> Hood 1978, fig. 140.
- <sup>118</sup> Boardman 1970, 42, 91, 99-100, col. pl. 12, pl. 59.
- <sup>119</sup> Niemeier 1985, 108; Walberg 1976, 52, fig. 38, motif 8, no. 3.
- <sup>120</sup> Evans I 1921, fig. 186e.
- <sup>121</sup> Evans I 1921, fig. 151.
- <sup>122</sup> Evans III 1930, pl. XV.
- <sup>123</sup> Karo 1930-33, no. 109.
- <sup>124</sup> Vermeule 1975, 40.
- <sup>125</sup> Ballintijn 1986, 34-35.
- <sup>126</sup> Vermeule 1975, 40.
- <sup>127</sup> Karo 1930-33, 298, 311.
- <sup>128</sup> Karo 1930-33, no. 310.

- 129 Poursat 1977a, no. 211.  
 130 CMS II 1, no. 62.  
 131 Banti 1930-1931, 196, fig. 58t.  
 132 Karo 1930-1933, no. 550c.  
 133 Karo 1930-1933, fig. 90.  
 134 Betancourt 1985, fig. 92.  
 135 Marinatos 1973, col. pl. XXIII; Immerwahr 1990, 179-180.  
 136 Dawkins 1904-1905, 283-284, fig. 14b.  
 137 Morgan 1988, pl. 200.  
 138 Niemeier 1985, 58, fig. 18, 5.  
 139 Karo 1930-1933, no. 764, pls. XCI-XCII.  
 140 Evans III 1930, 469, fig. 276a.  
 141 Karo 1930-1933, no. 785; 298.  
 142 Karo 1930-1933, fig. 59.  
 143 Poursat 1977a, no. 214.  
 144 Poursat 1977b, 72; Vapheio seal: CMS I, no. 249; the too squat rendering of the lion in Karo's drawing was earlier criticised by J. Schäfer (1958, 81) who, however, agreed with Karo's symmetrical reconstruction.  
 145 Poursat 1977b, 72.  
 146 CMS II 5, no. 270.  
 147 Evans II 1928, fig. 188a.  
 148 Marinatos 1973, pl. 114.  
 149 CMS II 1, no. 321a, from tholos grave B in Platanos; Yule 1981, pl. 6, motif 7, no. 9.  
 150 Karo 1930-1933, no. 396, pls. LXXXIX-XC.  
 151 Xenaki-Sakellariou 1988, pl. 2a.  
 152 Karo 1930-1933, no. 396, pls. LXXXIX-XC.  
 153 Yule 1981, 152, pl. 21, motif 31, no. 2.  
 154 Cameron 1968, fig. 13.  
 155 Morgan 1988, col. pl.: B-C.  
 156 Walberg 1986, 106-107, figs. 126-129 (fig. 126 shows the oldest specimen: CMS II 5 no. 276).  
 157 Marinatos 1973, pl. 68.  
 158 Van Buren 1939, II, pl. I, fig. 6. M. Ballintijn drew my attention to this representation.  
 159 Poursat 1977b, 188, 236-237.  
 160 Poursat 1977b, 237, n. 1.  
 161 Deshayes/Dessenne 1959, 77-79.  
 162 Hood 1971, 124.  
 163 Van Effenterre 1980, 537.  
 164 Deshayes/Dessenne 1959, 77-78.  
 165 Poursat 1977b, 237, n. 1; for sphinxes, see A. Dessenne, *Le sphinx*, Paris 1957.  
 166 Xenaki-Sakellariou 1958, no. 4, pl. I, 4.  
 167 Evans III 1930, 415-416, pl. 67, figs. 280-281.  
 168 Yule 1981, pl. 28, motif 50.  
 169 Yule 1981, pl. 6, motif 6, no. 1.  
 170 CMS II 3, no. 75.  
 171 CMS II 3, XXXVI.  
 172 Betancourt 1985, pl. 9 J.  
 173 Yule 1981, pl. 6, motif 7, nos. 6-8.  
 174 Karo 1930-1933, no. 295a.  
 175 Poursat 1977b, 195.  
 176 Poursat 1977b, 201.  
 177 Karo 1930-1933, no. 295a.  
 178 Younger (1984, 47, 48) attributes both representations to the Late Phase of the 'Mycenae-Vaphio Lion Master', whom he considers to be a Minoan immigrated to Mycenae.  
 179 Yule 1981, 162-163, pl. 27, motifs 48-49.  
 180 Karo 1930-1933, nos. 808-811, fig. 119, pls. CXLIII-CXLIV.  
 181 Niemeier 1985, 100, 102, 104, pl. 43: 1, 4.  
 182 CMS V 2, no. 690.  
 183 CMS XI, no. 226. The dating is proposed by Pini (p. XL).  
 184 Morgan 1988, 61.  
 185 Morgan 1988, 170.  
 186 Morgan 1988, 62.  
 187 Morgan 1988, col. pl. A.  
 188 Poursat 1977a, no. 206b: 'char(?)'.  
 189 Crouwel 1981, 59-60.  
 190 Crouwel 1981, 60-61, 114.  
 191 Crouwel 1981, 158 (G3), pl. 11.  
 192 Crouwel 1981, 158 (G7), 160 (L5), pls. 15, 32b respectively.  
 193 On an ivory game box from Enkomi. See Crouwel 1981, pl. 132.  
 194 Poursat 1977a, no. 206b.  
 195 Karo 1930-33, 319, nos. 491, 899, fig. 73 (ANM 899); Krzyszkowska 1988, 231, pl. 24a (ANM 491).  
 196 All the factual data and observations with regard to these ivories are based on information and illustrations in Poursat 1977a (nos. 334, 376-378, 408-420, 492, pls. XXXV, XXXVIII, XLI-XLIII, LIII) and Wace 1921-1923 (303, fig. 58).  
 197 The other depictions of animals are in the Aegisthus Group and the Vapheio Group. Fragments with small remnants of a relief representation, in which two lions reportedly appear (parts of the tails and a hind leg), probably in a heraldic pose, come from the Tomb of Aegisthus (Wace 1921-1923, 303, fig. 58). A bull with turned head, unfortunately badly effaced, is portrayed in relief on a plaque fragment from Vapheio (Poursat 1977a, no. 376, pl. XXXVIII).  
 198 Poursat 1977b, 249-250.  
 199 Poursat 1977b, 251; see also 225.  
 200 Krzyszkowska 1988, 231.  
 201 Poursat 1977b C 4: p. 22; Po 2: 35, 44, 124; Po 8: 36; Py 1-3: 26, 44; R 1: 119; for B 1, Ha 4, Ha 5 and Po 1: see my catalogue.  
 202 Poursat 1977b, 20.  
 203 Poursat 1977b, 109.  
 204 Poursat 1977b, 236, 244.  
 205 Poursat 1977b, 188.  
 206 ANM 9562; Mylonas 1973, 23, no. 502, pl. 11a; Poursat 1977a, no. 240; Boulotis 1988, no. 176 (excellent illustration on p. 200).  
 207 Mylonas 1973, 23, no. 502.  
 208 Mylonas 1973, 23, no. 502.  
 209 Mylonas 1973, 23, no. 502.  
 210 See for instance Evans I 1921, 430-435. In German: Kultknoten (see for instance Rutkowski 1981, 97-100).  
 211 Karo 1930-33, nos. 553-554, 558-560, pls. CLI-CLII.  
 212 Zervos 1956, pl. 527.  
 213 Marinatos 1973, col. pl. XVI.  
 214 Dawkins 1923, fig. 109.  
 215 Verlinden 1985, fig. 1.  
 216 Evans III 1930. Fresco fragment: fig. 143; (remains of) figurines: 428, figs. 294-296, suppl. pl. XXXVIII.  
 217 Immerwahr 1990, 175, pl. 41.  
 218 Evans III 1930, 428, figs. 294-296, suppl. pl. XXXVIII (remains of figurines), fig. 143 (fresco fragment).  
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# Einheitsjoch und Stylobatmaß Zu den Grundrissen des Zeustempels in Olympia und des Parthenon

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## Zusammenfassung

*An den dorischen Haupttempeln des Mutterlandes im 5. Jh., dem olympischen Zeustempel und dem Parthenon, soll gezeigt werden, daß sich das am Beginn des 5. Jh.s. aufkommende Einheitsjoch und eine einfache Stylobatproportion nicht, wie allgemein angenommen wird, widersprechen, sondern gerade die Verbindung dieser schwer zu verbindenden Architekturteile ein wesentlicher Bestandteil des dorischen 'Kanon' ist und nicht zuletzt den besonderen Reiz dieser Architektur ausmacht. Es kann nachgewiesen werden, daß nicht nur der Stylobat des Parthenon im Verhältnis 4 : 9 geplant war, sondern auch der Stylobat des Zeustempels im einfachen Verhältnis 3 : 7 entworfen wurde. Entscheidend für die Planung dürfte die Festlegung des Verhältnisses zwischen Normaljoch und Abstand E (Eckjoch + Achsabstand der Ecksäule) gewesen sein, woraus sich alle weiteren Schritte für die Konzeption des Grundrisses ergeben. Zuletzt wird darauf hingewiesen, daß dieses erstaunliche und bis ins Detail durchdachte proportionale Gefüge auf dem Hintergrund des 'Gegensatz-Denkens' der Zeit zu sehen ist.*

Seit dem grundlegenden Werk von H. Riemann über den dorischen Tempel aus dem Jahr 1935 gilt es gleichsam als Dogma in der Bauforschung, daß die am archaischen dorischen Tempel vielfach geübte Praxis, das Stylobatverhältnis in einfachen Proportionen zu bestimmen, im 5. Jh. im Mutterland verlassen wird und das Stylobatverhältnis in keinem ganzzahligen Verhältnis mehr steht. Neben dem im 5. Jh. den Grundriß bestimmenden Einheitsjoch wird die Bedeutung der Achsweiten besonders hervorgehoben.<sup>1</sup> Während sich im 6. Jh. am Heraion in Olympia (3 : 8) und am Apollontempel in Korinth (2 : 5) als den herausragendsten Beispielen einfache Stylobatproportionen feststellen lassen, so gilt bei den dorischen Tempeln des 5. Jh.s. der Parthenon mit seinem Stylobatverhältnis von 4 : 9 als die große Ausnahme. Vor allem in der zweiten Jahrhunderthälfte kommen bei Tempeln wie dem Hephaisteion, dem neuen Poseidontempel in Sunion u.a. die Dimensionen des Stylobats einer ganzzahligen Proportion auch nicht ansatzweise nahe. In der allgemeinen Skepsis gegenüber Proportionen bzw. Proportionssystemen an dorischen Tempeln dürften gerade diese 'sperrigen' Stylobatmaße ein gewichtiges Argument gegen Proportionen in dieser Architektur insgesamt sein. Während die Annahme einfacher Stylobatproportionen an Tempeln des 5. Jh.s. wegen mehr oder weniger großer Abweichungen von den Meßwerten in Abrede gestellt wird, wie z.B. das Verhältnis von 3 : 7 am olympischen Zeus-

tempel,<sup>2</sup> so gilt das Stylobatverhältnis von 4 : 9 am Parthenon als weitgehend gesichert (3088,87 cm : 6953,73 cm = 0,44420; 4 : 9 = 0,44444 oder 3088,87 cm x 9/4 = 6949,95 cm).<sup>3</sup> Im Mutterland ist dies der einzige dorische Tempel des 5. Jh.s., der der von Riemann zuerst formulierten Regel widerspricht, und dies wird folglich als eine der vielen Besonderheiten des Parthenon angesehen.

An den Grundrissen des Zeustempels und des Parthenon soll diese Regel einer kritischen Betrachtung unterworfen werden bzw. den Entwurfsprinzipien beider Tempel nachgegangen werden.

## DER ZEUSTEMPEL IN OLYMPIA

Beim Zeustempel kann von folgenden Prämissen, die weitgehend gesichert sind, ausgegangen werden:

1. Die Peristasis besitzt ein Einheitsjoch.<sup>4</sup>
2. Das NJ wird in der Forschung weitgehend übereinstimmend mit 16PF angegeben, wobei ein PF von 32,6-7 cm (522 cm : 16 = 32,62 cm) angenommen wird.<sup>5</sup>

Folglich ist auch für die STL der PF anzunehmen, woraus sich eine STL von 196PF ergibt (196 x 32,68 cm<sup>6</sup> = 6405,28 cm = ~6412 cm oder 6412 cm : 196 = 32,71 cm).<sup>7</sup>

Daraus lässt sich mit folgender Formel die STB errechnen:

$$\begin{aligned}
 10NJ + 2Abst.E &= 196PF \\
 2Abst.E &= 196PF - 160PF \\
 \mathbf{Abst.E} &= \mathbf{18PF}
 \end{aligned}$$

Diese Formel, bei der das Entscheidende das Zusammenziehen des EJ und des Achsabstandes der ES von der Stylobatkante (Abst.e) zum Abst.E ist,<sup>8</sup> habe ich schon 1998 in meinem Aufsatz 'Zum Grundriß des Parthenon' vorgestellt,<sup>9</sup> die dort lauten muß:  $(5NJ + 2Abst.E) : (14NJ + 2Abst.E) = 4 : 9$ . Für den Zeustempel folgt daraus weiter:

$$\begin{aligned}
 STB &= 3NJ + 2Abst.E = 48PF + 36PF \\
 \mathbf{STB} &= \mathbf{84PF} \\
 \mathbf{STB : STL} &= \mathbf{84PF : 196PF = 3 : 7}
 \end{aligned}$$

Es lässt sich also, die oben stehenden, in der Forschung weitgehend akzeptierten Prämissen vorausgesetzt, in einer lückenlosen Beweiskette zeigen, daß das Stylobatverhältnis des Zeustempels mit  $84PF \times 196PF$  geplant war, welches das einfache Verhältnis von  $3 : 7$  ergibt. In der Forschung wird dieses Stylobatverhältnis in Abrede gestellt, da der Meßwert der STB zu weit abweicht. Bevor wir darauf eingehen, soll den weiteren Entwurfsschritten nachgegangen werden. Im ersten Schritt wird also die einfache Stylobatproportion von  $3 : 7$  festgelegt, anschließend im zweiten Schritt nach der Formel  $(3NJ + 2Abst.E) : (10NJ + 2Abst.E) = 3 : 7$  das Verhältnis zwischen NJ und Abst.E:

$$\begin{aligned}
 (3NJ + 2Abst.E) : (10NJ + 2Abst.E) &= 3 : 7 \\
 \mathbf{NJ} &= \mathbf{8/9Abst.E}
 \end{aligned}$$

Anders ausgedrückt beträgt bei einer Säulenzahl von  $6 \times 13$  und einem Stylobatverhältnis von  $3 : 7$ , das Einheitsjoch vorausgesetzt, die STB  $21/4NJ$  und die STL  $49/4NJ$ .

Als nächste Schritte folgen mit großer Wahrscheinlichkeit die Gliederung des Abst.E in EJ und Abst.e und die Festlegung des UD der Säulen d.h. die Gliederung des NJ in NS und IK. Während wir für die beiden ersten Schritte beweisbare Proportionen bzw. Maßinterpretationen vorschlagen können, ist dies für das EJ, den Abst.e, die NS und das IK nicht möglich, nicht zuletzt auch wegen der differierenden Säulendicke. Diese notwendigerweise hypothetischen und sehr fraglichen Maßinterpretationen sollen deshalb hier weggelassen werden.

Zusammengefaßt sind also folgende Schritte naheliegend (Abb. 1):

1. Festlegen der einfachen Stylobatproportion von  $3 : 7$  bzw.  $84PF : 196PF$ .<sup>10</sup>
2. Bestimmen des Verhältnisses zwischen NJ und Abst.E von  $8 : 9$  bzw.  $16PF : 18PF$ .
3. Gliederung des Abst.E in EJ und Abst.e.
4. Festlegen des UD der Säulen bzw. Gliederung des NJ in NS und IK.

In weiterer Folge wird der Naos in die Peristasis eingefügt, sodaß dessen Maße von der Peristasis bestimmt werden. Auch die Maße des Aufrisses scheinen von der Peristasis abgeleitet zu sein.<sup>11</sup> Gerade am Zeustempel fällt die besondere Bedeutung der Peristasis nicht nur für den Grundriß sondern für den gesamten Bau ins Auge. Die Peristasis sind sozusagen die 'Beine', auf denen der ganze Tempel steht.

Wie bereits angedeutet, überschreitet die Diskrepanz zwischen dem Meßwert und der Maßinterpretation des Stylobats das tolerierbare Ausmaß, d.h. die tatsächliche STB ist um etwas mehr als 20 cm größer als die offensichtlich geplante STB (Messwert: 2768 cm;  $84 \times 32,68 \text{ cm} = 2745,12 \text{ cm}$ ). Auch wenn man den wahrscheinlich auf Erdbeben zurückzuführenden mangelnden Fugenschluß der Stylobatblöcke vor allem der STB, der ca. 5 cm ausmachen dürfte,<sup>12</sup> in Betracht zieht, so ist das restliche Übermaß von etwas mehr als 15 cm zu groß, um mit einer bloßen Ungenauigkeit in der Bauausführung erklärt werden zu können. Ein Grund dafür könnte die merkwürdige, wenn auch geringe Differenz zwischen den Säulendurchmessern der Fronten und der Langseiten sein, die im allgemeinen als archaisches Relikt gedeutet wird.<sup>13</sup> Die Dehnung der STB würde

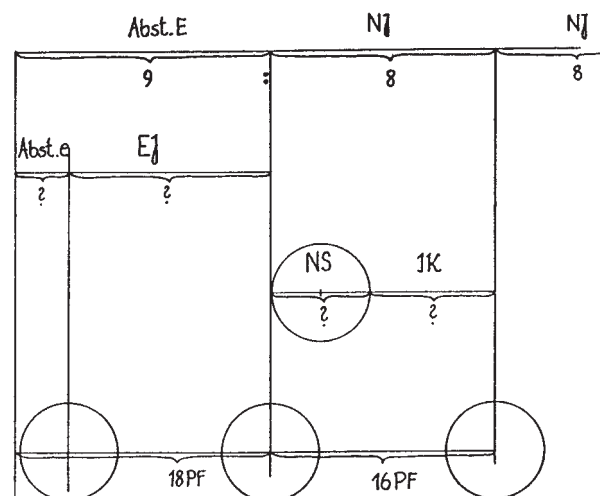


Abb. 1. Zeustempel, Entwurfsschritte.

etwas mehr Platz für die verdickten Frontsäulen schaffen bzw. einen zu geringen Stylobatüberstand vermeiden. Insgesamt dürfte jedoch die nicht nur im Stylobatmaß, sondern auch in den Säulen- und Jochmaßen spürbare Unsicherheit in der Ausführung des Baues<sup>14</sup> auf die nach gewissen Vorstufen<sup>15</sup> erstmalig in Angriff genommene und noch nicht vollkommen bewältigte große Aufgabe zurückzuführen sein, Einheitsjoch und einfache Stylobatproportion miteinander zu verbinden. Wenn wir dies als eine der großen Aufgaben der dorischen Tempelarchitektur des 5. Jh.s. sehen, so ist nach weiteren Anhaltspunkten zu suchen, um diese These zu untermauern.

#### DER PARTHENON

Am Parthenon,<sup>16</sup> der wie gesagt allgemein als Ausnahme von Riemanns Hypothese der unproportionierten Stylobatmaße im 5. Jh. gilt, lässt sich die am Zeustempel aufgezeigte Schrittfolge im Entwurf des Grundrisses am überzeugendsten nachvollziehen. Wenn wir hier von den Prämissen des Einheitsjoches und des in der Forschung weitgehend angenommenen Stylobatverhältnisses von 4 : 9 ausgehen, so lässt sich nach der oben vorgestellten Regel analog zum Zeustempel das Verhältnis zwischen NJ und Abst.E bestimmen:

$$(5NJ + 2Abst.E) : (14NJ + 2Abst.E) = 4 : 9$$

$$NJ = 10/11 Abst.E^{17}$$

Nimmt man ferner eine STB von 63PE (1PE = 49,028 cm) oder 189/2PF (1PF = 32,68 cm) an (63PE bzw. 189/2PF = 3088,79 cm), die ebenfalls von namhaften Bauforschern vertreten wird<sup>18</sup> und als sehr wahrscheinlich gilt, so lässt sich das NJ des Parthenon berechnen:

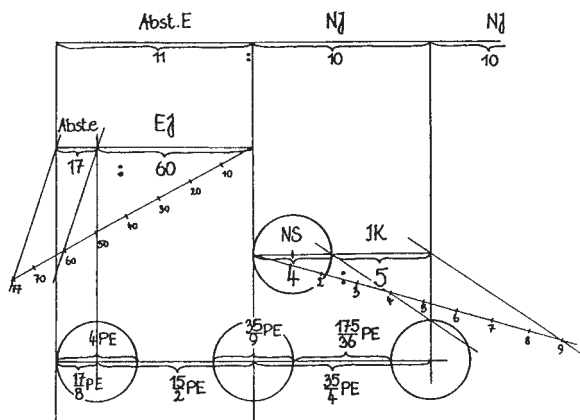


Abb. 2. Parthenon, Entwurfsschritte.

$$5NJ + 2Abst.E = 63PE$$

$$5NJ + 2 \times 11/10NJ = 63PE$$

$$NJ = 35/4PE^{19}$$

Analog zu der beim Zeustempel vorgeschlagenen Schrittfolge heißt dies beim Parthenon (Abb. 2):

1. Festlegen der einfachen Stylobatproportion von 4 : 9 bzw. 63PE : 567/4PE.
2. Bestimmen des Verhältnisses zwischen NJ und Abst.E von 10 : 11 bzw. Festlegen des NJ mit 35/4PE (> Abst.E = 77/8PE).
3. Gliederung des Abst.E in EJ und Abst.e im Verhältnis von 17 : 60 (> EJ = 15/2PE; Abst.e = 17/8PE).
4. Festlegen des UD der NS von 35/9PE bzw. Gliederung des NJ in NS und IK im Verhältnis 4 : 5 (> NS : NJ = 4 : 9).

Noch einmal ist zu betonen, daß sich NJ und Abst.E aus den gesicherten Prämissen des Einheitsjoches und des Stylobatverhältnisses von 4 : 9 und der sehr wahrscheinlichen STB von 63PE herleiten lassen. Da auch über das Verhältnis von NS : NJ = 4 : 9 in der Forschung weitgehende Übereinstimmung besteht,<sup>20</sup> woraus sich 35/9PE für die NS ergeben, so bleibt lediglich der zweite Schritt, die Gliederung des Abst.E problematisch. Während beim EJ die Differenz von Messwert und Maßinterpretation durchaus im tolerierbaren Rahmen bleibt,<sup>21</sup> weichen beim Abst.e der allerdings nur von Orlandos gegebene Messwert von 102,10 cm (Schnitt) und die Maßinterpretation von 17/8PE = 104,18 cm mit 2,03 % am weitesten voneinander ab. Es kann hier nicht eindeutig entschieden werden, ob ein Meßfehler von Orlandos oder Ungenauigkeiten in der Bauausführung vorliegen. Denkbar wäre es, daß sogar an einem bis ins letzte verfeinerten Präzisionsbau wie dem Parthenon ein letzter Rest der Schwierigkeit, Einheitsjoch und einfache Stylobatproportion vor allem auch in der Bauausführung zu verbinden, gerade im besonders sensiblen Bereich der Ecken ausgeglichen werden mußte.<sup>22</sup> Damit in Zusammenhang könnte auch das etwas mehr als übliche Abweichen unserer Maßinterpretation der ES von 4PE vom Messwert sein.<sup>23</sup>

Während beim olympischen Zeustempel zwar die ersten beiden Planungsschritte mehr oder weniger beweisbar sind, auch wenn das geplante Stylobatmaß von 3 : 7 nicht genau eingehalten wird, doch die Maßinterpretationen der Säulen und folglich auch des IK unklar sind, wodurch kein durchgehendes Proportionsschema erstellt werden kann, ist



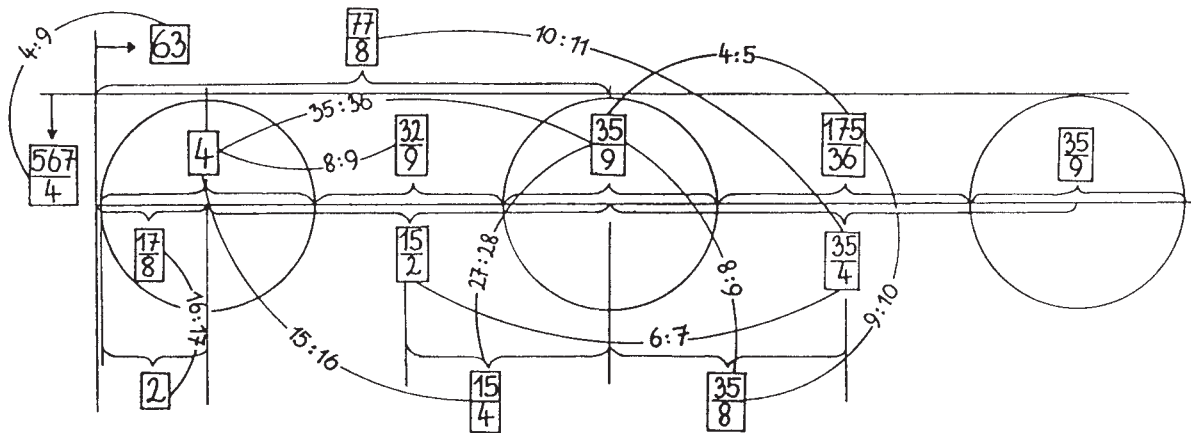


Abb. 3. Parthenon, Proportionsschema der Peristasis.

beim Parthenon die Erstellung eines lückenlosen Proportionsschemas der Peristasis trotz besagter Ungereimtheiten an den Ecken möglich (Abb. 3). Um die praktische Seite der Erstellung eines Proportionssystems zu beleuchten, ist folgende Vorgangsweise denkbar (Abb. 4): Auf einem sogenannten 'Zimmermannsboden' oder 'Reißboden',<sup>24</sup> auf dem die Bauteile im Verhältnis 1 : 1 aufgeschnürt werden, trägt man die 63PE der STB auf. Anschließend werden mit Hilfe des 'Strahlensatzes'<sup>25</sup> aus dieser Strecke die den angestrebten Proportionsverhältnissen entsprechenden Strecken herausgeschnitten. Es ist dies eine geometrisch-arithmetische Methode, die nicht nur sehr einfach, sondern auch sehr genau ist, da die Dimensionen an Ort und Stelle abgenommen und auf den Stein übertragen werden können. Dieser Vorgangsweise entsprechen auch die Ellenbrüche, indem eine Strecke (Zähler) in die vom Proportions-system geforderten Teile (Nenner) geteilt wird. Komplizierte Berechnungen sind hier nicht erforderlich, abgesehen davon, daß es insgesamt schwierig ist, ein derart umfassendes und geschlossenes Proportionssystem zu entwerfen. Die Methode des Strahlensatzes widerspricht der in der Forschung immer wieder erhobenen Forderung, daß der Daktylos und damit der Fuß nicht gedrittelt werden dürfen und die kleinste Einheit der halbierte Daktylos sei, da sich nur diese Teilung literarisch belegen lasse.<sup>26</sup> Doch schon das Verhältnis zwischen NS und NJ von 4 : 9 bzw. 35/9 : 35/4 beim Parthenon setzt eine Fußdrittung voraus.

Anhand der vorgestellten Ergebnisse sind folgende grundsätzliche Fragen zu stellen:

1. Ist das Dogma der unbestimmten Stylobat-

verhältnisse im 5. Jh. noch aufrecht zu erhalten, wenn die zwei Hauptstücke dieses Zeitraumes, der Zeustempel und der Parthenon, diesem Prinzip nicht unterliegen, wie wir nachzuweisen versucht haben?

2. Ist die in der Architekturforschung allgemein akzeptierte Feststellung Grubens, wonach der Grundriß des Zeustempels 'nicht, wie bei älteren Tempeln, aus den Stylobat- und Cellamaßen widerspruchsvoll abgeleitet, sondern aus einer klaren Grundeinheit, dem Säulenjoch von 16 dorischen Fuß, entwickelt' bzw. 'aus einem "inneren" Grundmaß, dem Säulenjoch von 16 Fuß ... durch Vervielfachung oder Teilung aufgebaut' ist, wobei 'die "äußeren" Größen, etwa des Stylobat-Rechteckes, dabei gleichgültig und abgeleitet sind',<sup>27</sup> so noch länger aufrecht zu erhalten?

Wie wir meinen, ist die Beantwortung beider Fragen, die natürlich unmittelbar zusammenhängen, von weitreichender Bedeutung für die Konzeption des dorischen Tempels des 5. Jh.s. und rührt unmittelbar an dessen Wesenskern. Auf dem Hintergrund der behandelten Tempelgrundrisse können diese beiden Fragen beantwortet werden, da sich gezeigt hat, daß das scheinbar unbestimmte Stylobatmaß am Zeustempel nur in Zusammenhang mit dem Einheitsjoch gesehen werden darf.<sup>28</sup> Wie es scheint, haben dorische Tempel des 5. Jh.s. in manchen Fällen nicht deshalb keine einfache Stylobatproportion bzw. ist diese nur annähernd hergestellt, weil sie für den Entwurf keine Bedeutung mehr hat, sondern weil es außerordentliche Schwierigkeiten bereitet, sie mit dem Einheitsjoch zu verbinden. Gerade der ältere Poseidontempel in Sunion wäre in dieser

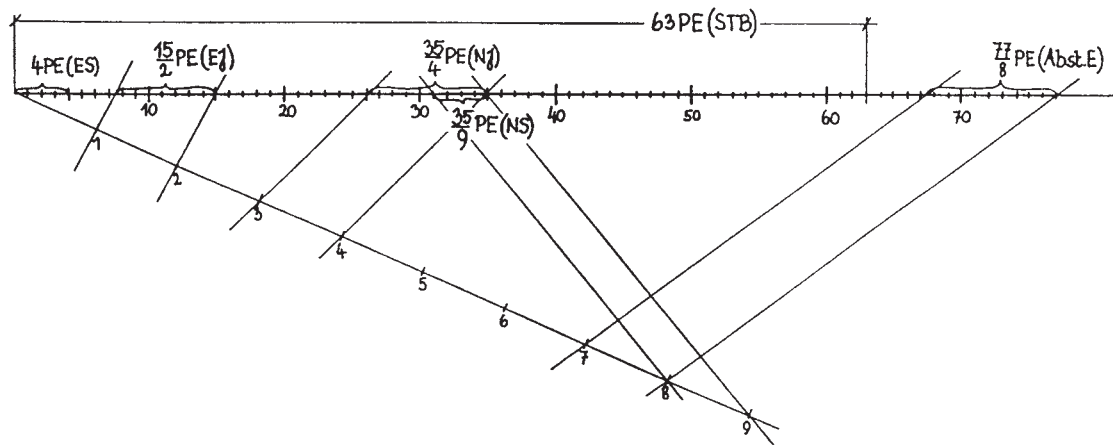


Abb. 4. Aufschneidern der Bauteile auf einem 'Zimmermannsboden'.

Hinsicht genauer zu untersuchen. Dieses, wie es scheint, erstrebte Ziel wurde nur beim Parthenon in vollkommener Weise gelöst, beim Zeustempel musste der zugrundeliegende Entwurf durch leichte Korrekturen verändert werden, um einen entsprechenden gleichen Stylobatüberstand auf allen Seiten zu erreichen. Nicht die einfache Stylobatproportion wird zugunsten des Einheitsjoches zurückgestellt, wie Gruben das meint, sondern mit kleinen Korrekturen auf beiden Seiten wird versucht, die Unsicherheit beim Erreichen dieses erstrebten Zieles zu überbrücken, denn minimale Unterschiede in den Jochweiten des Zeustempels weisen darauf hin, daß nicht nur bei den Stylobatmaßen versucht wurde, Differenzen auszugleichen. Dem sind die verschiedenen Lösungsversuche bzw. oft 'faulen Kompromisse' bei der Lösung des dorischen Eckkonfliktes zur Seite zu stellen. Auch wenn es nur beim Parthenon gelungen ist, einfaches Stylobatmaß und Einheitsjoch in nahezu vollkommener Weise zu vereinen und jedwede Unsicherheit zu überwinden - die weit über das notwendige Maß hinausgehende Eckkontraktion des Parthenon,<sup>29</sup> deren Begründung nicht im Eckkonflikt zu suchen ist, weist ganz in diese Richtung<sup>30</sup> - so ist schon beim Zeustempel das Bestreben ersichtlich, diese große Aufgabe zu lösen. Im späten 5. Jh., wie beim neuen Tempel in Sunion oder in Rhamnus u.a. wurde - und dies würde ganz dem Zeitgeist eintreffen - diese Aufgabe, wie es scheint, nicht mehr gesehen, doch müsste dies Thema genauerer Untersuchung sein. Wenn an archaisierenden Tempeln des 4. Jh.s. wie in Tegea sogar das Einheitsjoch wieder verlassen wird, so ist dies der folgerichtige Ausdruck des gezeichneten Entwicklungsstranges. Von 'klassischer Vereinfachung'<sup>31</sup> jedenfalls in

dem Sinn, daß die einfache Stylobatproportion zugunsten des Einheitsjoches aufgegeben wird, kann, wie es scheint, nicht gesprochen werden. Im Gegenteil wird in der zahlhaften Verbindung von Stylobat und Peristasis die Aufgabe den Grundriß zu erstellen wesentlich erschwert, doch gerade darin scheint der besondere Reiz zu bestehen. Wenn, wie häufig betont wird, im Zeustempel der Höhepunkt der dorischen Tempelarchitektur erreicht wird, so meinen wir, daß gerade in der Vereinigung von Stylobat und Einheitsjoch ein wesentlicher Teil dieses 'Kanon' bestehen muß.<sup>32</sup> Zweifellos erinnert dies an einen Schlüsselbegriff des 5. Jh.s., die Harmonia als Vereinigung des Gegensätzlichen bzw. Unvereinbaren,<sup>33</sup> wobei hier dieser Begriff nicht im Allgemeinen oder Intuitiven stehen bleiben soll, sondern auch ganz konkret als zahlhaftes Zusammenbinden der grundlegenden Bauteile des Tempels zu einer einheitlichen Komposition verstanden werden soll. Das Eigenartige und in weiten Teilen ja Rätselhaftes dieser Architektur liegt neben seiner praktisch-technischen Ausführung wohl in erster Linie in ihrem ideellen Kern, zu dem durchzustößen wir einen Anstoß geben wollen.

#### ABKÜRZUNGEN

PF = dorisch-pheidonischer Fuß; PE = dorisch-pheidonische Elle; AF = attisch-ionischer Fuß; STB = Stylobatbreite; STL = Stylobatlänge; NJ = Normaljoch; EJ = Eckjoch; Abst.E = Achsabstand der 2. Säule von der Stylobatkante; Abst.e = Achsabstand der Ecksäule von der Stylobatkante; NS = Normalsäule; ES = Ecksäule; IK = Interkolumnium; UD = unterer Säulendurchmesser.

- 1 Riemann 1935, 8-9: 'Wenn nun eine Normalisierung der Joche eintrat, war der Konflikt mit den Stylobatmaßen auch bei verengten Eckjochen nicht mehr lösbar ohne Zuhilfenahme komplizierter Rechnungen ... Der einfachere und schließlich kanonisch gewordene Weg war jedoch ein anderer, auf die Festlegung der Stylobatabmessungen zu verzichten und dafür die Hauptmaße in die Entfernungen der Ecksäulenachsen zu verlegen'; Gruben 2001, 41-42: 'Ein Jahrhundert lang mühten sich nun die Baumeister, neue, ästhetisch gegründete Ordnungsgesetze zu bilden. Dabei versuchte man, durch eine Proportionierung die beiden Grundriß-Rechtecke von Stylobat und Naos in das klärende Wesen der Zahl einzuspannen.' Die 'klassische Vereinfachung', vollzogen am Zeus-Tempel von Olympia, sieht Gruben darin, daß 'aus einem "inneren" Grundmaß, dem Säulenjoch von 16 Fuß, der gesamte Grundriß durch Vervielfachung oder Teilung aufgebaut ist. Die "äußeren" Größen, etwa des Stylobat-Rechteckes, sind dabei gleichgültig und abgeleitet' (vgl. auch ebd. 185); Coulton 1974, 74-75, 83; Wesenberg 1982, 113 u. Anm. 66; Mertens 1984b, 151, 176; Höcker 1993, 24. In der Magna Graecia geht die dorische Tempelarchitektur offensichtlich andere Wege. Nicht nur daß das Einheitsjoch an den 'Tavole Palatine' in Metapont und am Athenatempel in Paestum (Gruben 2001, 270, 281; Mertens 1984b, 150 u. Anm. 419) früher als im Mutterland auftaucht, so sind beispielsweise die Stylobate des Hera Lacinia-Tempels und des Concordia-Tempels einfach proportioniert (3 : 7 bzw. 4 : 9), wenn auch beim Hera Lacinia-Tempel geringfügige Unterschiede zwischen den Jochen der Fronten und der Langseiten bestehen (Gruben 2001, 336; Knell 1988, 108-110; vgl. Mertens 1984b, 177). Im Allgemeinen ist durch Besonderheiten der großgriechischen Tempel, wie Mitteljoch, gleitende oder fehlende Eckkontraktion usw. die Vergleichbarkeit in diesem Bereich mit mutterländischen Tempeln nicht unmittelbar gegeben. Hervorzuheben ist, daß sowohl Gruben als auch Knell schon beim Hera Lacinia-Tempel, besonders jedoch beim Concordia-Tempel das Bestreben des Architekten hervorheben, Einheitsjoch und einfache Stylobatproportion miteinander zu vereinen, welches jedoch nur in Parallele zum Parthenon gesetzt wird.
- 2 U.a. Riemann 1935, 59.
- 3 Messwerte nach Penrose 1851, 9, die nach wie vor als die zuverlässigsten gelten (vgl. Berger 1984, 119; Mertens 1984a, 58; Korres 1994b, 79). Aus der Zusammenfassung der wichtigsten Forschungsmeinungen zu Proportionsverhältnissen am Parthenon (Sonntagbauer 1998, 136 Tab.1) ist ersichtlich, daß Dinsmoor, Berger, Wesenberg, Mertens, Stucchi u.a. die Proportion 4 : 9 annehmen, während sie von Riemann, Bankel und de Waele in Abrede gestellt wird. 4 : 9 findet sich auch bei Coulton 1974, 66, Gruben 2001, 185, Knell 1988, 53, mit Vorbehalt bei Korres 1994b, 80.
- 4 Gruben 2001, 42, 57. Das Einheitsjoch läßt sich im Mutterland zum ersten Mal am älteren Poseidontempel in Sunion am Beginn des 5. Jh.s. nachweisen (Gruben 2001, 230).
- 5 Dörpfeld 1966, 19; Dinsmoor 1950, 152; Mallwitz 1972, 231; Coulton 1975, 88; Grunauer 1981, 272-275; Gruben 2001, 57; Knell 1988, 43.
- 6 1PF = 32,68 cm entspricht der von Berger 1984 am Parthenon errechneten und von uns übernommenen PE = 49,028 cm.
- 7 Auch die STL dürfte wie die STB durch Erdbeben etwas gedehnt worden sein. Die erstmals von Dörpfeld 1966, 19 und anschließend Romano 1981, 132-133 aufgezeigten metrologischen Beziehungen zwischen dem Zeustempel und dem olympischen Stadion, wobei die STL des Zeustempels einem Drittel des Stadions entspricht (192,28 cm : 3 = 6409,33 cm), scheinen dies zu bestätigen. Neben der guten Übereinstimmung von Messwert und Maßinterpretation spricht auch die hervorragende Teilbarkeit von 196PF (2 x 2 x 7 x 7) für die vorgeschlagene Maßinterpretation. Geht man von einer Stadionlänge von 600PF aus, so müsste folglich, wie schon Dörpfeld festgestellt hat, die STL des Zeustempels 200PF zu 32,04 cm betragen. Doch gibt es keinen Sinn, für das NJ und die STL verschiedene Fußmaße zu veranschlagen. Das unkanonische Fußmaß des Stadions oder die andernfalls beliebige Stadionlänge hat schon Dinsmoor 1950, 251 zu folgendem Schluß veranlaßt: 'It is hardly reasonable to assume that these stadia were erected with reference to so many local varieties of foot units; the true reason still escapes us'; vgl. Dörpfeld 1890, 177-179; Lehmann-Haupt 1929, 1932-1943.
- 8 Voraussetzung für die Gültigkeit dieser Formel ist unter anderem ein gleichmäßiger Stylobatüberstand bzw. Achsabstand der Ecksäulen von der Stylobatkante (Abst.e) auf allen Seiten, wie er beim Zeustempel und beim Parthenon gegeben ist. An westgriechischen Tempeln wie dem Hera Lacinia- und dem Concordia-Tempel hat Mertens 1984b, 105, 114 Anm. 244 differierende Stylobatüberstände festgestellt.
- 9 Sonntagbauer 1998, 141.
- 10 Wie es scheint, sind sowohl beim Zeustempel als auch beim Parthenon die Stylobatverhältnisse von der Säulenzahl nach der Formel  $n/2 : n + 1$  abgeleitet (Zeustempel: 3 : 6 + 1; Parthenon: 4 : 8 + 1); vgl. Sonntagbauer 1998, 141 u. Anm. 62; Coulton 1974, 66-74.
- 11 Vgl. Gruben 2001, 57: 'Durch das kanonische Einbinden der völlig symmetrisch geplanten Cella geht auch sie im Jochmaß auf ... Im Aufbau zieht sich diese Einheit in gleichmäßiger Halbierung bis ins Dach hinauf.' Anders Grunauer 1981, 273; vgl. Wesenberg 1982, 122; Mertens 1984b, 176 u. Anm. 616, 178.
- 12 Nach mündlicher Auskunft von A. Hennemeyer. In einem wiederholten Lokalaugenschein in Olympia konnte ich diese Angabe flüchtig überprüfen.
- 13 Vgl. Gruben 2001, 59.
- 14 Schon Dörpfeld 1966, 6 hat geringfügige Unterschiede zwischen den Jochen der Front- und der Langseiten festgestellt; vgl. Mallwitz 1972, 214; Grunauer 1971, 118, 121-122. Auch am klassischen Poseidontempel in Isthmia, der dem Zeustempel formal sehr nahe steht, finden sich kleine Unterschiede zwischen den Front- und Langseitenjochen (Broneer 1971, 73-74). Trotzdem ist wie beim Zeustempel von einem Einheitsjoch auszugehen.
- 15 Als Vorstufe zum Zeustempel kann der ältere Poseidon-Tempel in Sunion gelten, bei dem 'die Entwurfs-Prinzipien der Klassik unmittelbar vorbereitet' sind (Gruben 2001, 230).
- 16 Zu Proportionen am Parthenon vor allem Riemann 1935, 72-110 u. Tab. 3; Dinsmoor 1950, 160-163; ders., 1923, 177-180, 241-244; Wesenberg 1982, 99-125; Berger 1984, 119-174; Bankel 1984, 33-39; ders. 1983, 65-99; ders. 1991, 151-163; Mertens 1984a, 55-65; de Waele 1984, 99-114; kritisch zu Proportionsstudien insgesamt Korres 1994a, 62-64; ders. 1994b, 79-80.

- <sup>17</sup> Daraus folgt: STB = 36/5NJ; STL = 81/5NJ.
- <sup>18</sup> U.a. von Dinsmoor, Wesenberg, Berger (vgl. Sonntagbauer 1998, 136 Tab. 1). An dieser Stelle sei auch auf die umfassende und langjährige Diskussion hingewiesen, ob der Parthenon im PF oder AF entworfen sei; dazu vor allem Bankel 1983, 1984, 1991; Wesenberg 1982, 1984, 1995; vgl. auch Korres 1984a, 63-64; Schneider/Höcker 1990, 135; Höcker 1999, 989-991; allgemein zur Verwendung kanonischer Fußmaße bzw. Moduli: Wesenberg 1975-1976, 15-22; Höcker 1993, 39-49 u. Anm. 184; De Zwarte 1994, 115-143; zuletzt Wilson Jones 2000, 73-93.
- <sup>19</sup> Das NJ von 35/4PE wird u.a. von Dinsmoor, Wesenberg und Berger vorgeschlagen (vgl. Sonntagbauer 1998, 136 Tab. 1).
- <sup>20</sup> Neben Gruben 2001, 185 wird dieses Verhältnis u.a. vertreten von Dinsmoor, Berger, Bankel, Mertens und Stucchi (vgl. Sonntagbauer 1998, 136 Tab. 1), dazu von Korres 1994b, 80 und Hoepfner 1995, 156.
- <sup>21</sup> Maßinterpretation 15/2PE = 367,71 cm; Messwert bei Orlandos (1976, Taf. 94) 368,90 cm (Schnitt).
- <sup>22</sup> Die bereits früher vorgebrachten Argumente (Sonntagbauer 1998, 141-143) seien noch einmal zusammengefaßt und ergänzt. Neben der Möglichkeit, daß Orlandos bei seiner Messung das durch den größeren Durchmesser bedingte Hereinrücken des Mittelpunktes der Ecksäule nicht beachtet hat, da sein Maß dem Abstand der NS von der Stylobatkante entspricht, sprechen folgende Argumente für die Maßinterpretation von 17/8PE: 1. Zieht man von den weitgehend gesicherten 63PE der STB die ebenfalls einigermaßen gesicherten NJ und EJ der Fronten ab, so entsprechen die übrigbleibenden Abstände von je 17/8PE = 104,18 cm unserem Wert (63PE [3088,76 cm] minus 5 x 35/4PE [5 x 428,99 cm = 2144,97 cm] minus 2 x 15/2PE [2 x 367,71 cm = 735,42 cm] = 17/8PE [104,18 cm]). 2. Die teilweise sehr großen Unterschiede der Messwerte der NJ und der EJ (NJ bei Orlandos von 426,6 - 430,8 cm), die, wie es scheint, nicht auf ungenaue Messungen, nachträgliche Veränderungen oder mangelnden Erhaltungszustand, sondern auf Ungenauigkeiten in der Bauausführung zurückzuführen sind, wurden möglicherweise auch an den Ecken ausgetragen, sodaß die ES etwas nach außen gerückt wurden, um etwas zu groß geratene Joche auszugleichen. 3. Gruben 2001, 183 und Dinsmoor 1950, 338 haben nachgewiesen, daß in weiten Bereichen die Maße des Apollontempels III in Delos 3/7 der Maße der Peristasis des Parthenon und die Hälfte der Pronaosmaße ausmachen. Nimmt man den Messwert von Courby 1931, Taf. 12) von 44,8 cm für den Abstand beim Apollontempel, so erhält man folglich beim Parthenon 104,53 cm, welches unserer Maßinterpretation ganz nahe kommt.
- <sup>23</sup> Die Maßinterpretation von 4PE = 196,11 cm kommt außerdem nur bei Riemann vor (vgl. Sonntagbauer 1998, 136 Tab. 1). Sie weicht vom Messwert bei Penrose 1851, 10 von 194,70 cm (Schnitt) um 1,41 cm oder 0,72% ab. Zur bereits angedeuteten Begründung (vgl. Sonntagbauer 1998, 143-144) ist hinzuzufügen, daß bei den Säulen Messwerte und Maßinterpretationen in der Regel weiter auseinanderklaffen, da an den Graten, an den Sehnen zwischen den Graten und im Kannelurental gemessen werden kann. Eine Rolle könnte auch die Verwendung des bereitliegenden Trommelmaterials des Vorparthenon II (vgl. Gruben 2001, 173; Korres 1994b, 89) spielen.
- <sup>24</sup> Vgl. Mertens 1994b, 184 Anm. 654.
- <sup>25</sup> Vgl. Mertens 1994b, 51.
- <sup>26</sup> Literatur zusammengefasst bei Sonntagbauer 1998, 137-138, bes. Anm. 45; dazu auch Höcker 1993, 57-59; Mertens 1984b, 43; Mertens 1993, 85.
- <sup>27</sup> Gruben 2001, 57, 42, 185.
- <sup>28</sup> Schon am olympischen Heraion ist das Bestreben zu spüren ein einfaches Stylobatmaß mit einer zahlhaften Ordnung der Peristasis zu verbinden (z.B. bestimmt Dinsmoor 1950, 337 das NJ der Langseiten mit 10PF, welche dem durchschnittlichen Messwert gut entsprechen), sodaß die am Heraion erstmalig auftauchende Eckkontraktion und die im 6.Jh. übliche Jochdifferenzierung auch auf diesem Hintergrund zu sehen sind.
- <sup>29</sup> Vgl. Gruben 2001, 179, 185; Wesenberg 1982, 114 Anm. 67, 122.
- <sup>30</sup> So auch Coulton 1974, 76.
- <sup>31</sup> Gruben 2001, 41.
- <sup>32</sup> Gruben 2001, 44: 'Im Zeustempel ist, wenn irgendwo, der "Kanon" verwirklicht. Den Grundriß durchwirkt ... eine einheitliche Ordnung.'
- <sup>33</sup> Vgl. Heraklit VS 22 B 10, A 23.

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# Carthage Bir Massouda

## *Preliminary report on the first bilateral excavations of Ghent University and the Institut National du Patrimoine (2002-2003)*

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*with contributions by Babette Bechtold, Hans Koens, Karin Schmidt and Wim Van Neer*

### Abstract

*Rescue excavations on the Bir Massouda site have given important evidence for the urban development of Punic Carthage. The position of a city boundary in the form of 'casemate'-walls was established. Outside this boundary, an 8th century BC cremation necropolis (the earliest of Carthage) was succeeded by metal working quarters after the mid-7th century BC. In the late 5th century BC, this part of the city was reshaped into residential quarters. A selection of finds of the Punic period both show the range of materials yielded by these excavations and proof of the advanced technological skills of the Carthaginian iron workers.*

Dedicated to H.G. Niemeyer, H. Schubart and M. Pellicer Catalán marking the 40<sup>th</sup> anniversary of West-Phoenician settlement archaeology

### INTRODUCTION

Rescue excavations on the Bir Massouda site, in the centre of present-day Carthage, are being conducted on a large scale and with the coordinated involvement of different teams since the year 2000 (fig. 1). Under the *aegis* of the Institut National du Patrimoine (INP, Tunis) and the 'conservation du site de Carthage' and the latter's successive directors, Abdelmajid Ennabli and Fethi Chelbi, these excavation projects have yielded considerable remains of the Archaic, Middle and Late Punic, Roman Imperial, Vandal, Byzantine, Islamic Medieval and recent periods. The site has thus become one of the best-studied multi-period sites within the territory of ancient Carthage. This preliminary report presents both the general results of the excavations (Part I.A-B) and the detailed discussion of some of the finds (Part II.A-D).

#### I.A. THE SPRING CAMPAIGN

*Fethi Chelbi, Roald F. Docter, Boutheina M. Telmini*

The spring campaign of 2002, on which we report here, took place between May 2<sup>nd</sup> and 23<sup>rd</sup> and benefited from extremely good weather conditions. The excavation was the first of a series of

bilateral campaigns by the Archaeological Department of Ghent University (UGent) and the Institut National du Patrimoine (INP, 'conservation du site de Carthage'), directed by Fethi Chelbi and Roald F. Docter.<sup>1</sup> It builds on earlier research on the Bir Massouda site by the two field directors in 1988 (Chelbi<sup>2</sup>), 1987-1993 (Docker with the University of Hamburg<sup>3</sup>), and 2000-2001 (Docker, University of Amsterdam<sup>4</sup>). As in the campaigns of 2000 and 2001, we closely cooperated with the team of the University of Cambridge/Open University Cambridge, directed by Richard Miles (Miles 1999; Miles 2000). The system of field recording with an overall master grid and the finds registration with a communal database, which had been developed in 2000 for the coordinated excavations of Cambridge and Amsterdam, were applied in 2002. The division of the Bir Massouda field in a Site 1 (Cambridge, to the north) and a Site 2 (Amsterdam, now Ghent/Tunis, to the south) was maintained.

In spring 2002, this joint Tunisian-Belgian team consisted of 10 members: apart from the two directors, the field team consisted of Boutheina M. Telmini of the Université de Tunis I, the Tunisian students Soumaya Garsallah (Université de Sfax) and Lamia Fersi (Université de Tunis I), and the Belgian students Birgit Taverniers and Eline Deweydt (both Ghent University). The finds team consisted of four specialists: Sihem Roudesli-Chebby (INP, Carthage: physical anthro-

pology), Babette Bechtold (Graz: Punic pottery), Karin Schmidt (University of Hamburg: Roman pottery), and Lara Laken (Amsterdam: Punic and Roman wall plaster). Apart from the team members actually taking part in the 2002 spring campaign, the project has secured the cooperation of the following specialists for the future publication: Taoufik Redissi (INP, Tunis: Punic and Egyptian small finds), Hans Koens (University of Amsterdam: metal restoration and metallurgy), and Wim Van Neer (Royal Museum of Central Africa, Tervuren: archaeozoology). A publication campaign is scheduled for the year 2005.

#### First results

The results of the spring campaign are manifold. Given the fact that the new bilateral excavations continued the earlier University of Amsterdam investigations in trenches 1 and 8 (fig. 1), the main supplementary information regarding these parts

of the Bir Massouda site should be mentioned first (on conventions, see below, note 18).

In both trenches metallurgical remains had been found already in the 2000 campaign, but only trench 8 had effectively yielded metal working remains *in situ*. In trenches 1 and 7, farther to the south, metallurgical waste in the shape of slag and bellows' pipes were found in some quantities, but always in secondary position. Theoretically, these remains could have been the background scatter of a more concentrated iron working quarter in the area of trench 8, although already the high number of such finds would suggest otherwise. In spring 2002, final confirmation for actual metal-working could be found in trench 1. A rather thick and relatively extended layer of hammer-scales was found *in situ*, suggesting the forging of iron in this part of Carthage over a long period of time (context BM02/1245; see fig. 2).<sup>5</sup> Also in trench 8 two more iron working hearths were found *in situ* (BM02/8221, filled with BM02/8217; fig. 3; BM02/

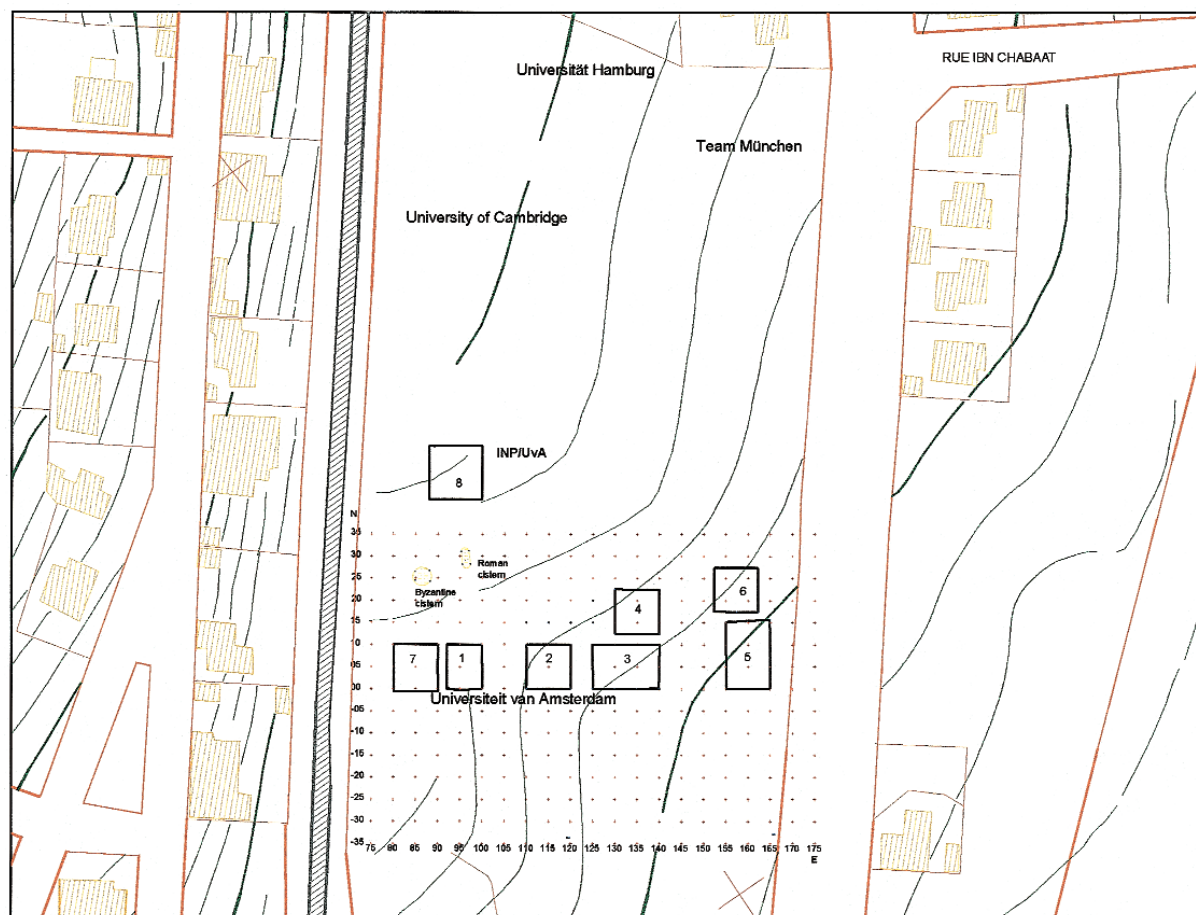


Fig. 1. Bir Massouda site (AutoCAD 2000 version by A. Mezzolani).



8232, filled with BM02/8231: *fig. 4*). Moreover, it became clear that the area had been levelled with a homogeneous layer of yellowish clay before the iron working installations were first used, e.g. BM02/8227 (*fig. 4*; see the contribution of H. Koens, p. 60-66). The date of the transformation of the area into a metal working quarter is still to be established with precision, but it may have taken place somewhere after the middle of the 7<sup>th</sup> century BC. Detailed study of the finds from the 2002 campaign may clarify this matter (see also the contribution of F. Chelbi, B.M. Telmini, p. 46-48).

As the University of Amsterdam excavations mainly had been guided by the aim of documenting layers of the 6<sup>th</sup> and 5<sup>th</sup> centuries BC, excavation had stopped where these levels had been reached. This means that the earliest material previously found is either dating to the last quarter of the 5<sup>th</sup> century BC (see Bechtold forthcoming d) or dating to the 8<sup>th</sup> till 6<sup>th</sup> century BC, but re-deposited in the last quarter of the 5<sup>th</sup> century BC (see Docter forthcoming c). The date of transformation of the metallurgical area into a residential quarter could, consequently, be dated rather accurately to the last quarter of the 5<sup>th</sup> century BC. The new bilateral excavations, in contrast, have yielded a considerable number of contexts consisting homogeneously of Archaic material dating to the 8<sup>th</sup> and 7<sup>th</sup> centuries BC (see below).

Below these Archaic layers the virgin soil was reached at a level of H 9.65m-9.75m above sea level in the northern part of trench 8. If one compares these levels with those found in the Hamburg excavations farther to the north (H 8.44m-9.24m above sea level<sup>6</sup>), it becomes clear that the palaeo-landscape of the Bir Massouda site dropped towards the north. This is contrary to the slope of the present-day terrain, suggesting that the original morphology of site up to Punic times had been characterised by a more southern Byrsa hill ridge. That this ridge is to be situated over trench 8, seems confirmed by the fact that the virgin soil in trench 7 was reached at a level of H 8.46m-8.88m above sea-level (see Chelbi, Telmini, Docter forthcoming, and below). This morphology had been changed at a certain point, probably during the rigorous Augustan reconstruction of the city and most likely in order to raise the course of the east-west *Decumanus Maximus*, which runs over the Hamburg site.

On the basis of the 2000 and 2001 campaigns of the University of Amsterdam some working hypotheses as regards the topography and urban development of Punic Carthage could be developed. These were basically two (see Docter 2000;



*Fig. 2. Trench 1: thick layer of hammer-scales, evidencing the forging of iron over a long period of time (context BM02/1245) (photo UGent/INP).*



*Fig. 3. Trench 8: iron working hearth (BM02/8221, filled with BM02/8217) (photo UGent/INP).*



*Fig. 4. Trench 8: iron working hearth (BM02/8232, filled with BM02/8231), dug in homogeneous levelling layer of yellowish clay (BM02/8227) (photo UGent/INP).*



Docter 2001; Docter forthcoming e). In the first place, it was suggested that the area excavated by the University of Amsterdam, that is to say the southern part of the Bir Massouda site, was situated *extra muros* in Archaic times. The investigations of the University of Hamburg in the northern part of the terrain had clearly shown that this part of the city had been densely built from the second half of the 8<sup>th</sup> century BC onwards (see Niemeyer *et alii* forthcoming). The southern half, however, showed signs of large-scale metallurgical activities, typical for non-residential areas outside the city. In-between these two areas a city boundary in the shape of a city wall was consequently postulated. In fact, on the Ibn Chabâat site farther to the east, excavated by the German DAI, a double wall reinforced by transversal walls had already been documented. This double wall is very much comparable to the late 5<sup>th</sup> century BC eastern city wall excavated at Carthage's sea-front by F. Rakob from the late 1970s onwards.<sup>7</sup> Finding the exact location of the continuation of this boundary on the Bir Massouda site should have been the goal of further excavations in the near future. Much to our surprise, however, already the 2002 excavations in trench 8 yielded evidence of a wall quite similar to the Ibn Chabâat and coastal ones: two parallel walls with transversal reinforcements (fig. 5). This double wall was found to sit remarkably enough exactly within the northern perimeter of the 'industrial' metal working area and, moreover, exactly on the highest point (ridge) of the eastern Byrsa slope (see above). If the reconstruction of these walls as a city wall proofs correct, the spaces in-between the walls, consequently, would have functioned as open



Fig. 5. Trench 8: two parallel walls with transversal reinforcements (southern city wall of the Archaic period?), viewed towards the Northeast (photo UGent/INP).

rooms typical of casemate-walls and had apparently been used in the (late 7<sup>th</sup>?), 6<sup>th</sup> and 5<sup>th</sup> centuries BC to house the iron working installations found in trench 8. This is not uncommon, since the close relationship between city walls and metal working installations is paralleled in other contemporary Phoenician settlements, so e.g. in La Fonteta near Alicante.<sup>8</sup>

In the second place, some residual material found in the 2000 and 2001 campaigns was clearly of funerary character. In combination with the postulated *extra muros* position of the terrain, this gave birth to the hypothesis that this part of the Bir Massouda site once may have been the place of the necropoleis of the 8<sup>th</sup> century BC, which had still been missing in the archaeological record of Carthage. Although the virgin soil has been reached in very small deep soundings in trenches 1 and 8, no actual traces of graves have been found on their surfaces. The finds of the 2002 campaign however, strengthened the initial hypothesis of reworked necropolis material in this part of the Bir Massouda.<sup>9</sup> Therefore, the necropolis hypothesis had to be pursued (see below).

#### I.B. THE DISCOVERY OF AN 8<sup>TH</sup> CENTURY BC NECROPOLIS IN TRENCH 7 (SUMMER CAMPAIGN 2002 AND WINTER CAMPAIGN 2002/2003)

Fethi Chelbi, Boutheina M. Telmini

A Tunisian team of the 'conservation du site de Carthage' of the INP continued the spring excavations of the mixed Tunisian-Belgian team in two field campaigns between June 2002 and January 2003.<sup>10</sup> Directed by Fethi Chelbi and within the framework of the above-mentioned bilateral project, Boutheina M. Telmini, and two (doctorate) students, Lamia Fersi, and Soumaya Garsallah, excavated a large portion of trench 7 and 1 till the virgin soil (fig. 1). Here, at 4.31m below the present ground level and at an elevation of 8.88m above the sea level, the violated remains of the oldest necropolis of Punic Carthage were discovered.

Cut into the calcareous bedrock, no less than nine different round pits could be documented, in all likelihood the *pozzi* in which the cremation urns of the earliest inhabitants of Carthage had been set. Similar cremation *pozzi* have been published from other Phoenician sites, as e.g. most recently from the legendary mother city of Carthage itself, the metropolis of Tyre (Aubet/Núñez/Trellisó 2000).

A cremation necropolis had been suspected to exist on the Bir Massouda site 2 on the basis of various indications in the archaeological record

(see above). Already the investigations of the INP of 1988 on the Bir Massouda site, within a trench that later would be numbered as trench 8, had yielded material of Archaic date, in which wasters of metallurgical activity and some typical funerary ceramic shapes like the 'mushroom jugs' occurred prominently. At that time, the latter fact had struck one of the present authors (Chelbi), since the Archaic necropoleis, known since the 19<sup>th</sup> century, were situated much farther to the north (Juno and Douimès-Dermech). Unfortunately this early suspicion of a funerary aspect on the Bir Massouda terrain remained unpublished. It is only at the end of the winter campaign 2002/2003 that the team of the 'conservation du site de Carthage' could confirm this suspected funerary aspect.

The cremation necropolis may be considered to date to the period before the well-known necropolis to the north of the Archaic settlement, on the Colline de Junon, came into existence, that is to say to within the 8<sup>th</sup> century BC. The Juno necropolis has given evidence, apart from cremation burials, for a different way of burial, inhumation, which is clearly a later funerary rite in the Phoenician world.<sup>11</sup> Apart from that, the fact that the *pozzi* had been cut into the bedrock already implies an early date.

For a better understanding of the finds in the lowest part of trench 7 it is useful to look at the stratigraphical sequence into some detail. Although some chronological indications are given, based on a first screening of all the material, the precise dating of the different layers has to be postponed till the study season, scheduled for summer 2005.

At least four large occupation phases can be discerned. In fact, the latest layers in trench 7, dating to the Late Roman, Vandal, Byzantine, and Medieval periods, had already been excavated by the University of Amsterdam in 2000; these will be published in the forthcoming final report.<sup>12</sup> The uppermost level excavated in 2002 consists of a probably Augustan levelling layer, composed of mixed material of Roman and Punic date. Below it, that is to say below the level of 11.69m above sea level, the typical destruction layer of 146 BC, containing carbonised material, and the first layers of Late Punic date were encountered. Within the relevant layers of the Punic period, dated to between the middle of the 8<sup>th</sup> till the middle of the 2<sup>nd</sup> century BC, we have discerned at least three clearly distinct occupation phases, separated from each other by rather thick yellowish-orange sandy levelling layers.

1 The Middle to Late Punic Period (5<sup>th</sup> to mid 2<sup>nd</sup> century BC): two *torba* floors (BM02/7214 and

BM02/7218), the upper one lying at H 10.82m above sea level, and a wall of well-hewn ash-lars.

A sandy yellowish orange levelling layer (context BM02/7233) lies over 10.45m (above sea level) and apparently separates the Middle-Late Punic phase from the Archaic ones. Although it was found to be rather poor in pottery, it is significant that only from this level onwards one finds Punic Red Slip Ware ceramics. Remarkably, this ware is represented with no less than two thirds of the pottery collected in the layer.<sup>13</sup> Black glazed pottery is totally absent from this layer, which in relation with the Red Slip Ware pottery suggests a dating in the 6<sup>th</sup> century BC or earlier. This is at the same time a *terminus ante quem* for the structures found above and a *terminus post quem* for all the layers found below, foremost for the layers connected with metallurgical activities.

- 2 The first phase of Archaic occupational activities encountered in this trench can be related to metallurgical workshops. It is composed of several individual layers related to the workshop activities. Quite remarkable is the absence in these layers of Red Slip Ware plates with rim types that are typical of the second half of the 7<sup>th</sup> and the 6<sup>th</sup> centuries BC. The majority of the material seems to date to the second half of the 8<sup>th</sup> and the first half of the 7<sup>th</sup> century BC. It is equally remarkable that the material in these layers contains a significant number of vessels, which seem to be of a funerary character (see also above).

The levelling layer just below (context BM02/7238) was found over 9.09m above sea level. It constitutes a *terminus ante quem* for the above-mentioned layers connected with the metallurgical activities in this area. The yellowish or light brown layer is rather poor in pottery, which prevents the formulation of a clear chronology for its deposition. It is very much comparable to the layer found in trench 8 (see below, contexts BM02/8227; BM02/8245). The level found just below context BM02/7238 (context BM02/7239), however, which is the last before reaching the bedrock contains material clearly datable to the second half of the 8<sup>th</sup> and the first quarter of the 7<sup>th</sup> century BC. Among the material<sup>14</sup> one notes imported transport amphorae from the South of Spain (*Círculo del Estrecho de Gibraltar*; cf. here Cat. 11, fig. 8c), Red Slip Ware pottery from the Levant, Corinthian fine ware pottery, and Attic SOS transport amphorae. Another

context, which was found just on top of the bedrock (so at the same level), but preserved in the south-east corner of trench 7, contained much burnt material and was in general much darker. In it, a rim fragment of an Euboean Late Geometric *skyphos*, dating to the second half of the 8<sup>th</sup> century BC, was found, as well as a fragment of a local Red Slip Ware plate with an incised symbol on its interior, very similar to the well-known sign of Tanit.<sup>15</sup>

- 3 The second phase of Archaic activity encountered in trench 7 is at the same time the earliest. It is composed of a series of nine *pozzi*, which are clearly of a funerary nature, cut into the bedrock.<sup>16</sup> Although they apparently had been cleared out already in Antiquity, some dark brown material still remained at the bottoms of these *pozzi*. One of these pits (BM02/7319) still contained clear traces of ash and charcoal. Also the surrounding bedrock showed evidence of burning at several places, which may perhaps be explained by cremation on the spot itself. The material found in the fillings of the *pozzi* consisted of some small pottery fragments and some animal bones (mainly of cattle).<sup>17</sup> The pottery seems to date homogeneously to within the second half of the 8<sup>th</sup> and the first quarter of the 7<sup>th</sup> century BC (see Chelbi, Telmini, Docter forthcoming), so more or less contemporary with the pottery found in the layer above (BM02/7238).

In conclusion, one can say that the most important contribution of this excavation lies in the identification of a funerary sector lying outside the traditionally recognised Archaic burial places. This sector most probably extends farther to the southwest, since the virgin soil in this part of the terrain consists of bedrock. In contrast, in the

northern part of the terrain, within trench 8, the spring campaign of 2002 has shown that the virgin soil consists of heavy dark brown clay. This is exactly the same structure as the virgin soil encountered in the excavations of the University of Hamburg farther to the north (Niemeyer 1987, 8). This difference in composition and structure of the virgin soil may explain the absence of *in situ* funerary layers in the northern part of the Bir Massouda terrain, towards trench 8. Apparently, the earliest inhabitants of Phoenician Carthage thought the bedrock to be ideally suited for cutting burial *pozzi*. The separation between the bedrock encountered in trench 7 and the brown clay virgin soil, found in trench 8, has to be found somewhere in-between. This is one of the questions to be pursued in the coming excavations of the year 2003. The burial place was apparently cleared out already during the 7<sup>th</sup> century BC (around the middle?), probably in relation with the installation of the metallurgical workshops.

## II. SELECTED FINDS FROM BIR MASSOUDA SITE 2 (SPRING CAMPAIGN 2002)

Fethi Chelbi, Roald F. Docter, Karin Schmidt

The joint excavations of the Archaeological Department of Ghent University and the INP on the Bir Massouda site in spring 2002 yielded finds, mainly pottery, in huge quantities. This is hardly surprising for a Mediterranean multi-period site like Carthage. The detailed study of these finds, however, has not been possible within the limited time set for the spring campaign. Given the fact that the site is still threatened by the imminent construction of the National Court of Appeal, all efforts were directed towards the rescue work in the field and the first processing of the finds

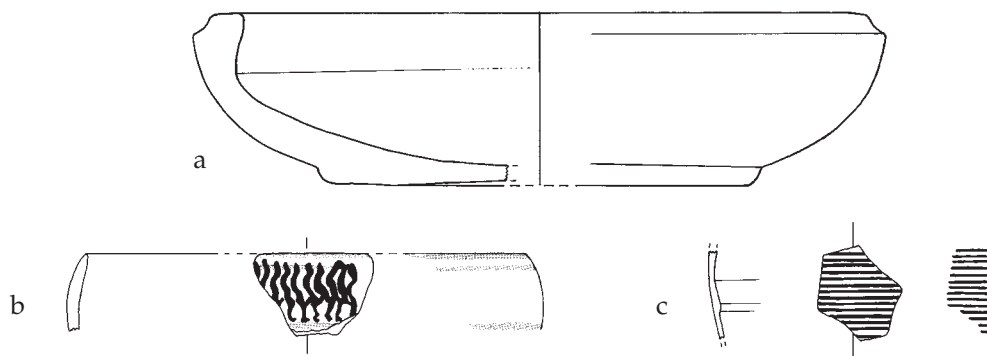


Fig. 6. Context BM02/8210: a. fragment of a stone grinding basin (Cat. 1); b. rim fragment of Carthaginian kotyle of type Aetos 666 (Cat. 2); c. wall fragment of small Thapsos type jug (Cat. 3) (drawings by R.F. Docter, inked by J. Angenon).

(washing, drying and storing), leaving any coherent inventory and study plans for the future. Notwithstanding this minimal option and in order to offer some insight in the scope of finds and contexts encountered on the site, it was decided to present at least some material in a preliminary way.

This presentation of some of the finds is structured in three parts.<sup>18</sup> Roald Docter and Boutheina Telmini discuss 14 fragments from 7 different archaeological contexts, all of Archaic date (part II.A; *figs. 6-8*). Unfortunately, each single Archaic context was so large that it proved unfeasible to study any one in detail for this preliminary report. In contrast, Babette Bechtold discusses the finds from one small Middle Punic context in extenso (part II.B; *figs. 9-10*), supplemented by an analysis of the animal bones from this context by Wim Van Neer (part II.C). This is the way in which we would like to present the finds in a forthcoming final publication. It is also the way in which the finds from the preceding excavations of the University of Amsterdam on the Bir Massouda site 2 are prepared for publication (Docker forthcoming b). The last part of the preliminary presentation of the finds is contributed by Hans Koens, who discusses some of the bellows' pipes encountered in trench 8 in relation to the metallurgical activities which took place on the site (part II.D). Moreover he offers some thoughts on one particular type of metal finds, needles.

#### II.A. SELECTED FINDS OF THE ARCHAIC PERIOD FROM TRENCH 8 (SPRING CAMPAIGN 2002; *figs. 6-8*)

*Roald F. Docter, Boutheina M. Telmini*<sup>19</sup>

The selection of 14 fragments from 7 different contexts, discussed here, is perhaps rather unrepresentative of the finds from trench 8, apart from the fact that they date to the 8<sup>th</sup>, 7<sup>th</sup>, and 6<sup>th</sup> centuries BC. Having continued the excavation at the level, where in November 2000 the University of Amsterdam had stopped, Archaic and Middle Punic (5<sup>th</sup> century BC) levels were encountered almost immediately. Consequently, only few contexts in trench 8 are of a later date. The 14 fragments have been chosen for their intrinsic interest or for their importance to the understanding of the site.

##### *Context BM02/8210 (Cat. 1-3; fig. 6)*

This context is the first 'undisturbed' Archaic context excavated in a small deep sounding below the level where in November 2000 the excavations of

the University of Amsterdam had stopped, that is to say BM02/8210 started at a level of H 10.79m above sea level.<sup>20</sup> The first 8-14cm of this layer were excavated as BM02/8210, ending rather artificially at a level of H 10.65m above sea level in the eastern part of the deep sounding and H 10.71m in the western part. While excavating BM02/8210, it turned out that the area below the hearth BM00/8092 and its fill BM00/8097+8098, which had been excavated already in 2000, still continued. This find was taken out separately as context BM02/8212, containing a bellows' pipe, some slag and some stones, which perhaps are part of the hearth base. Upon reaching the arbitrary level of H 10.65-10.71m it turned out that three 'archaeologically' different layers had been excavated as one single context BM02/8210. In the first place a dark grey, compact clayish levelling layer with material of the 8<sup>th</sup> and 7<sup>th</sup> centuries BC, which had been deposited to the northern side of the Archaic wall BM02/8271 (below Middle Punic wall BM00/8003) and in which the hearth BM00/8092 had been set. In the second place a thin band of yellowish clay, clearly a preparation layer for the first use of the iron working installation in this area (connected with the first use of BM00/8092, that is to say BM02/8212?; on such layers see below). And in the third place a dark grey very compact clayish levelling layer containing extremely much pottery and lying below the yellowish band. This third, lowest layer was only touched in the south-east corner of the deep sounding, but probably accounts for most of the finds collected as context BM02/8210.

##### *Cat. 1: BM02/32205, 1 rim fragment of a stone grinding basin (fig. 6a)*

Greyish-black basalt (import, perhaps from Egypt or the Near East<sup>21</sup>); inner surface polished; diam. rim 25, diam. base 16, H 6.2.

The flat-based grinding basin finds a good parallel in the German DAI excavations in the Rue Ibn Chabâat, farther to the east (Vegas 1999a, 176, fig. 83,2: from context K93/11). That vessel is of almost exactly the same dimensions: diam. rim 25 and H 6.5. Also the indent in the rim is near identical, although in the Ibn Chabâat piece it is placed slightly lower. Comparable stone basins are encountered rather regularly on the Levantine Coast (Lehmann 1996, 461, pl. 93,502/1, 502/3). Similar rim shapes are found with ceramic versions of the tripod grinding basins in the local Carthaginian pottery repertoire, suggesting that the ceramic basins had been derived from the imported stone ones (e.g. Vegas 1999a, 177-178,



fig. 85,6). The Ibn Chabâat basin differs from the Bir Massouda piece by having a hardly pronounced, low ring foot. The fact that the typical rim shape is shared by ceramic grinding basins with a flat base, ring base and tripod base, may be an argument for a close relationship of these three pottery shapes. It is not impossible that these vessels were used for the same purposes. Recently, M. Botto argued - convincingly - that tripod basins had been used in the East and in Central Italy as grinding basins for spices, which would have been added to the wine during commensally banquet gatherings (Botto 2000, 67-69). This idea had already been foreshadowed in the discussion of the vessels' functions by H.-G. Buchholz, who places these gatherings rather in the sacred sphere (Buchholz 1963, 62-67, esp. 63). Whether this particular function can be transferred to Carthage as well remains to be investigated.

*Cat. 2: BM02/32206, 1 rim fragment of a Carthaginian kotyle of type Aetos 666 (fig. 6b)*

Clay KTS clay structure; decoration in Red Slip; diam. rim 16, PH 2.8.

This rim fragment may be assigned to a local Carthaginian *kotyle* of the Late Geometric type Aetos 666. Although A. Peserico diminishes the importance of the Phoenician and Punic *kotyle* versions (Peserico 2002, 83), it is now becoming clear that the shape was produced rather commonly in the Carthaginian potteries.<sup>22</sup> The ones adapting the decoration scheme of the Aetos 666 *kotylai* may be considered as the oldest amongst the Carthaginian *kotylai*, perhaps even being of the same date as the originals, that is to say of c. 750-715 BC in the generally accepted Corinthian chronology (see Docter forthcoming a, with table).

The *kotyle* type Aetos 666 owes its name to the Corinthian piece, which was found in Aetos on Ithaka and had been published by S. Benton in 1953 (Benton 1953, 279, 281, pl. 42,666). Some ten years later, it was G. Buchner who first stamped the name using it for vessels found (and made) in Pithekoussai (Buchner 1964, 264, fig. 1a; Ridgway 1981, 45). Although no Corinthian original of this type has been found in Carthage up to this moment, Pithekoussan versions are not uncommon. Already in the first deep sounding in the Carthaginian settlement, in which Archaic finds could be recorded, the so-called Ben-Ayed property, in the northern part of the Bir Massouda site, two fragments of such a Pithekoussan *kotyle* were found.<sup>23</sup> In the course of the German DAI excavations four more pieces have come to light

(Vegas 1997, 352-353; Vegas 2002a, 134, 138-139, fig. 2,14). Also in the Hamburg excavations below the *Decumanus Maximus*, east of the Ben Ayed property and in the northern part of the Bir Massouda site, four or five Pithekoussan *kotylai* of the Aetos 666 type were found, three of which belonging to one context.<sup>24</sup>

*Kotylai* of type Aetos 666 must have been highly popular in the West during the 8<sup>th</sup> century BC, since apart from Corinthian originals, local versions are known from Italy (Capua, Megara Hyblaea and Villasmundo; see Peserico 1995, with references) and even in Carthage.

Here, two local miniature versions of this *kotyle* type have been found in the so-called 'Chapelle Cintas' in the tophet area.<sup>25</sup> A large version, very much comparable to the one presented here, was found in the Rue Ibn Chabâat (Vegas 1999a, 150, fig. 43,3; context K 90/126). It has a rim diam. of c. 15cm, but is remarkably thin-walled. Its decoration is executed in Red Slip, as in the case of the other local ones from Carthage. It is likely that the Carthaginian *kotylai* Aetos 666 derive from the Pithekoussan versions of the type, imported in the settlement in some quantities.

*Cat. 3: BM02/32207, 1 wall fragment of a small Thapsos type jug (fig. 6c)*

Clay Corinthian (?); decorated with black paint on surface; diam. wall 10, PH 3.1.

A decoration consisting of multiple lines characterises this fragment of a small jug. It hints at an attribution to the so-called Thapsos-class. This Late Geometric class of fine wares owes its name to the site of Thapsos (present-day Magnisi) on a small peninsula northeast of Syracuse.<sup>26</sup> The class is mainly represented with *skyphoi* and *kantharoi*, but kraters, *pyxides*, *oinochoai* and jugs are also encountered. Especially the decoration with multiple horizontal lines is typical for the class. They regularly cover the body almost completely, but may be alternated by geometric patterns in the handle zone or, in the case of closed vessels, the neck. A tendency towards a simplification of the decoration is recognisable. The majority of the Thapsos type vases is covered completely with black paint, though.

The problem, whether the Thapsos class has been produced in Corinth or elsewhere, is still not solved, in spite of a long and lasting discussion. C.W. Neeft thinks of 'a major ceramic and possibly trade centre flourishing until c. 700 BC and probably situated to the west of Corinth'. The fabric is comparable to that of the regular Proto-corinthian pottery, but has a rather more levi-

gated clay and a more shining paint.<sup>27</sup> According to Benton (Benton 1953) and Neeft, the class is to be considered as a second-rate pottery class, the heavy walled fabric of which was better suited for transport abroad than the contemporaneous common Corinthian pottery. In this respect it should be noted that the present fragment from Carthage is rather thin-walled, though.

The distribution pattern of the Thapsos Class differs completely from that of the contemporary Corinthian pottery (Neeft 1981, figs. 12-14), in particular that of *kotylai*. Corinth is represented with only very few examples.<sup>28</sup> With regard to Carthage, the present fragment would constitute the second original Thapsos class vessel found up to this moment, and the first closed vessel. The other fragment, a *skyphos*, comes from the Hamburg

excavations below the *Decumanus Maximus* (see Docter forthcoming a, Cat. 4124). They may have arrived in Carthage either through Sicily or Pithekoussai, where many examples of the class have been found, or on a direct route. For a shipment via Pithekoussai would speak the circumstantial fact that the Hamburg excavations have also yielded an Italic version of a Thapsos *skyphos*, known from Pithekoussai as well (Docter forthcoming a, Cat. 4213).

*Context BM02/8215 (Cat. 4-8; fig. 7)*

This context is an artificially distinguished layer of 5-10cm thickness, which may still have belonged to the same levelling layer as the lowest part of BM02/8210 (see above). It is separated from BM02/8210 by another artificial layer of some 5-10cm thickness: BM02/8214. BM02/8215 is described as a dark brown compact clayish layer with a lot of pottery. These finds seem to date to the 8<sup>th</sup> and 7<sup>th</sup> centuries BC.

*Cat. 4: BM02/32209, base fragment of a Greek, probably Corinthian, kotyle (fig. 7e)*

Clay Corinthian (?); diam. base 4, PH 2.7.

The decoration scheme of the *kotyle* base is clearly paralleled in the Early Proto-Corinthian (EPC) repertoire, where it is dated to between 715 and 685 BC (Docter forthcoming a, esp. Cat. 4132). It is characterized by a black painted lower body with a reserved line in the lower part. The reserved foot with painted line seems unusual, though. Also the fabric would only tentatively allow for an attribution to Corinth.

*Cat. 5: BM02/32210, wall fragment of a 'table amphora' (fig. 7a)*

Clay KTS clay structure; wavy triglyph motif in black paint; diam. wall 20, PH 6.6.

*Cat. 6: BM02/32211, wall fragment of a 'table amphora' (fig. 7b)*

Clay KTS clay structure; reserved zone between two zones of Red Slip bordered by a black line; diam. wall 26, PH 9.6.

*Cat. 7: BM02/32212, wall fragment of a 'table amphora' (fig. 7c)*

Clay KTS clay structure; Red Slip zone bordered below (and probably also above) by a black line; diam. wall 22, PH 6.1.

The fragments of three different vessels can be assigned to 'table amphorae' of types recently classed as Karthago 3A, 3B, 4A, 4B, and 5A.<sup>29</sup> In

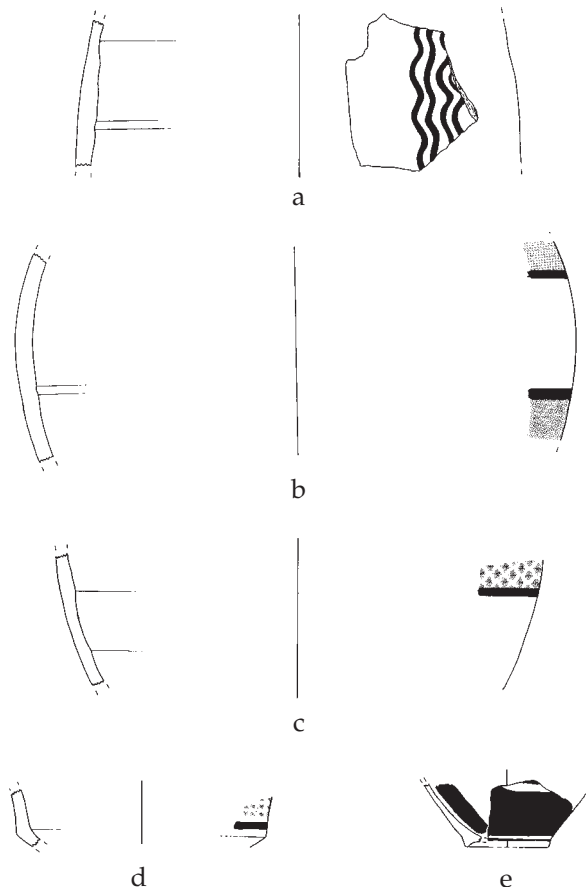


Fig. 7. Context BM02/8215: a-c. 3 wall fragments of 'table amphorae' Bichrome Ware (Cat. 5-7); d. wall fragment of carinated bowl in Bichrome Ware (Cat. 8); e. base fragment of probably Corinthian kotyle (Cat. 4); (drawings by R.F. Docter, inked by J. Angenon).

the old classification of P. Cintas such vessels have been classed as forms 44-46, 199-201, 211-212, 214-218, 230-236, and 238-239 (Cintas 1950, pls. 3, 16-18). Vegas only lists few examples of such shapes in her recent classification of Punic pottery, mainly because it is based on material from settlement contexts (Vegas 1999a, 154-156, figs. 50-52: Forms 19-20). Three different decoration schemes are represented by the small selection published here (fig. 7a-c). In the first place, the wavy triglyph motif in the handle zone found with early examples of classes Karthago 3A1, 3B1, 4A1, and 5A1 (fig. 7a). These generally date to the second half of the 8<sup>th</sup> and the 7<sup>th</sup> centuries BC. In the second and third place, bichrome decorations of classes Karthago 3B2, 4A2, and 5A2 (fig. 7b-c). In the case of Cat. 7 (fig. 7c), the decoration scheme is probably identical with the 'medial band decoration' of W. Culican (cf. Docter 1997, § VII.2.1.3.2-3), whereas Cat. 6 (fig. 7b) is the reverse of it, consisting of a reserved zone between two bichrome zones.

These fragments are only a few of a whole series found in the 2002 campaign. This fact is highly remarkable since these vessels are found only rarely in settlement contexts.<sup>30</sup> Rather they find their best and often only confrontations as cremation urns in funerary contexts of the 8<sup>th</sup> and 7<sup>th</sup> centuries BC, both in the tophet and the necropoleis. The explanation may be found in the particular composition of the Bir Massouda assemblages of trench 8. We are probably facing a combination of re-worked necropolis material and garbage deposits, as one would normally expect to find outside city walls.<sup>31</sup> Similar residual finds of necropolis material, viz. Bichrome Ware 'mushroom jugs', were encountered within the Augustan levelling layers at the Byrsa hill and later proved to originate in an Archaic necropolis below (e.g. Thuillier 1982, 169, 171, fig. 211,5).

*Cat. 8: BM02/32213, wall fragment of a carinated bowl (fig. 7d)*

Clay KTS clay structure, Red Slip zone and black line below; interior smoothened; diam. at carination 11.5, PH 2.7.

The wall fragment with carination probably belongs to a carinated bowl, which Vegas recently discussed as Form 15, 'Becher mit Wandknick' (Vegas 1999a, 151-152, fig. 46). Its diam. conforms to the standard size of 11 to 16cm. The decoration of the present fragment is typical of the Bichrome Ware, which is remarkable, since the shape occurs mainly in the Red Slip Ware. The typology of Red Slip Ware open shapes by A. Peserico discusses

these vessels as type Bic (Peserico 2002, 28-36, 67, fig. 5, pl. 5). Only one parallel is found in the Bichrome Ware (Vegas 1999a, 151-152, fig. 46,1). When found in the Red Slip Ware, the shape is dated to the 7<sup>th</sup> and early 6<sup>th</sup> centuries BC, but mainly to within the second half of the 7<sup>th</sup> century BC. It remains to be investigated whether Bichrome Ware versions are perhaps earlier.

*Context BM02/8224 (Cat. 9-10; fig. 8a-b)*

This context lies below BM02/8215 (see above), but is separated from it in a vertical way by a stratum of two adjacent contexts (BM02/8219 in the east and BM02/8218 in the west). The division between the latter two contexts is formed by a small stone foundation of a north-south wall (BM02/8220). Still at the level of BM02/8224 this foundation separates a western part (BM02/8224) and an eastern part (BM02/8226). It proved to be impossible to determine whether the levelling layers of contexts BM02/8218, 8219, 8224, and 8226 were deposited against the wall BM02/8220 or rather the other way around, that the wall (foundation) had been set into these levelling layers. BM02/8224 is described as a blackish, very compact sandy layer. Its contents seem to date to within the 8<sup>th</sup> and 7<sup>th</sup> centuries BC.

*Cat. 9: BM02/32575, rim fragment of a jug (fig. 8a)*  
Clay KTS clay structure (?),<sup>32</sup> Red Slip decoration (light red 2.5 YR 6/8); diam. rim 12.5, PH 4.8.

Exact parallels for the rim shape are still unknown in the published record of Carthage. Closest is the neck amphora Vegas' Form 35, which dates to the second half of the 8<sup>th</sup> and the 7<sup>th</sup> centuries BC (Vegas 1999a, 168-169, fig. 71). This vessel is characterised by an off-set neck and two handles. These jugs are mainly known from the tophet, on the basis of which finds Cintas labelled them as form 325 (Cintas 1950, 153, pls. 27, 95). The German DAI excavations yielded only 9 (?) fragments of such vessels: 1 from the Ben Ayed property, 1 from the Rue Ibn Chabâat, and 7 from the Magon Quarter. The fact that the particular rim shape of Cat. 9 (fig. 8a) is never matched in the parallels cited for the general shape, is remarkable, since the still un-inventoried material from the 2002 campaign on the Bir Massouda yielded several fragments with this rim shape.

When looking for closer parallels for the rim, one has to face east. The typical rim shape consists of what we may term a 'collar ridge' below the mouth, which is formed by means of pressing

the clay of the rim down- and outwards. The rim shape is found on the Levant coast and farther inland in present day Syria. Excavations at Tell Ahmar (on the Upper Euphrates) yielded a nice parallel, a 'jar with externally thickened/folded out-turned rim' in stratum 3 (Jamieson 2000, 267, 272, fig. 6,3). Stratum 3 pre-dates the Neoassyrian period and may belong to the first half or probably the first quarter of the 7<sup>th</sup> century BC. Another parallel, albeit apparently on a lower neck, in the (monochrome) painted ware comes from Tell Qarqur in the Orontes Valley, in transitional Iron Age I-IIA levels, that is to say dating to the 10<sup>th</sup> and the 9<sup>th</sup> centuries BC (Dornemann 2000, 480-481, fig. 22,10). A one-handled jug with this rim shape has recently been published from the Megiddo excavations, coming from level F-5, which is stratum VIA of the University of Chicago excavations, dated to the early 8<sup>th</sup> century BC (Finkelstein 1999, 57-58, fig. 1,7). The recent exca-

vations in Beirut yielded similar rims of large closed vessels (Badre 2000, 943, 951, fig. III,1-3, with references), which are matched by a good example from Tyre Stratum IV, dated to c. 760-740 BC (Bikai 1978, pl. 17,2). Also in the contemporary cooking pot wares (CPW) from the area the rim shape is completely at home (e.g. Jamieson 1996, fig. 6,5-6: 'CPW jars with out-turned grooved rims', type CPW/J4, from Beirut, with many references for the Levant Coast).

*Cat. 10: BM02/32576, 1 rim fragment with handle of an East-Greek kotyle (fig. 8b)*

Clay very pale brown (10 YR 7/3) with some very fine quartz (<0.1mm), black paint: double horizontal line over handle and remains of triglyph next to handle attachment; diam. rim 10, PH 3.1.

The *kotyle* does not find a close parallel in the published record of Carthage, but the fabric allows for an attribution to the East-Greek world. In comparison with Corinthian examples, the vessel may be dated to the 7<sup>th</sup> century BC.

*Context BM02/8235 (Cat. 11; fig. 8c)*

This context is a dark brown very compact filling with sand and clay below the small north-south wall or foundation BM02/8220. The material in it may be dated to the second half of the 8<sup>th</sup> and 7<sup>th</sup> centuries BC.

*Cat. 11: BM02/32583, rim fragment of a transport amphora CdE 1 A1 (fig. 8c)*

Clay reddish yellow (5 YR 6/6) with grey core, few rounded quartz, white particles and schist (1.0mm), surface reddish yellow (5 YR 6/6); diam. rim 11, PH 3.3.

This rim belongs to a transport amphora, which originates in the so-called *Círculo del Estrecho de Gibraltar*, that is to say the area around the Straits of Gibraltar. More specifically, the fabric points at the Málaga production area. Recently the class has been defined as CdE 1, being short for *Círculo del Estrecho* 1, and more particularly to its earliest version, subclass CdE 1A (Docter 1997, § VI.1.2.1, tab. 24, esp. figs. 56, 64-71, 579e). In the classification of J. Ramón the subclass occurs as T-10.1.1.1 (Ramón 1995, 229-230, 461, 647, figs. 109, 281, map 108). Although the subclass can be dated to the second half of the 8<sup>th</sup> and the beginning of the 7<sup>th</sup> century BC, the import of the class as a whole in Carthage seems to fall predominantly within the first half of the 7<sup>th</sup> century BC (Docter 1997, § VI.1.3.4, tab. 18, figs. 542-543).

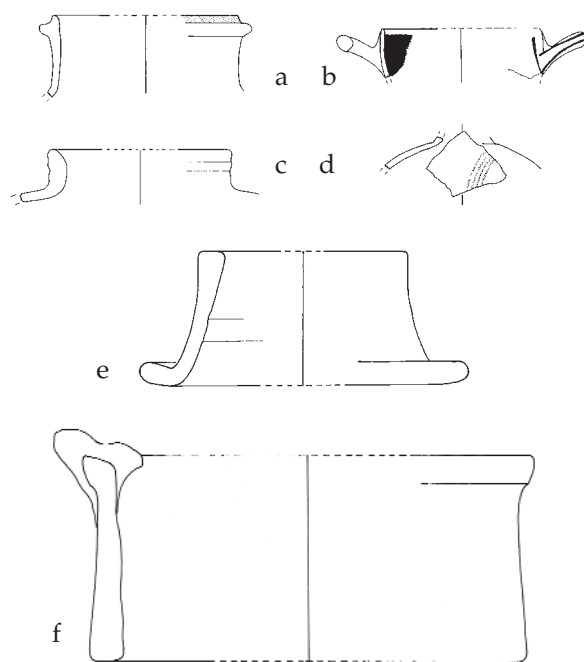


Fig. 8. Context BM02/8224: a. rim fragment of jug, painted (Cat. 9); b. 1 rim fragment with handle of East-Greek kotyle (Cat. 10). Context BM02/8235: c. rim fragment of South-Spanish transport amphora (Cat. 11). Context BM02/8245: d. shoulder fragment of juglet, imitating Cypriot juglets? (Cat. 12). Context BM02/8243: e. profile fragment of pot stand (Cat. 14). Context BM02/8251: f. profile fragment of cooking stand (Cat. 13) (drawings by R.F. Docter, inked by J. Angenon).



*Context BM02/8245 (Cat. 12; fig. 8d)*

This context is a rather sterile compact yellowish clayish layer, which probably had been deliberately spread out over the area south of the Archaic wall BM02/8271 in order to prepare the terrain for the new metallurgical installations. More particularly, this layer is in connection with the large hearth BM02/8236, which had been filled after its latest use with context BM02/8217 (fig. 3). East of BM02/8245, on the other side of Archaic wall BM00/8032+ BM02/8209, the layer seems to continue; there it has been excavated as context BM02/8227 (fig. 4; see also below). Also to the north of the east-west wall BM02/8271 the layer has been observed (see above, context BM02/8210). An almost identical layer had been found in the French excavations on the Byrsa hill.<sup>33</sup> Here too, the layer prepared a new metallurgical, iron working function of the terrain, albeit of later date. The material included in the yellow layer on the Byrsa doesn't date after the middle or end of the 4<sup>th</sup> century BC. The iron working installations of the Byrsa hill, consequently, date to the late 4<sup>th</sup> and 3<sup>rd</sup> centuries BC, continuing to the end of that century. It should be noted, though, that S. Lancel provides arguments for an earlier dating (*terminus post quem*) of the Byrsa metallurgical installations: last quarter of the 5<sup>th</sup> to first quarter of the 4<sup>th</sup> century BC (Lancel 1982, 238). On the function of these preparation layers, see the contribution of H. Koens below. As regards the pottery included in the Bir Massouda preparation layer BM02/8245 (as Cat. 12), the possibility should be taken into account that this material originates in the area where the yellow clayish material had been collected. This may even have been outside the city of Carthage proper.

*Cat. 12: BM02/32601, shoulder fragment of juglet (fig. 8d)*

Clay KTS (?);<sup>34</sup> reddish painted concentric circles applied with multiple brush; diam. at carination to neck 4.2, PH 2.1.

The fragment with 4 concentric circles painted on the shoulder is to be attributed to a small jug, probably imitating juglets of the Cypriot White Painted III or IV Ware in the classification of the Swedish Cyprus Expedition (Gjerstad *et alii* 1948). Elsewhere in Carthage, jugs of this origin and these wares have been found sporadically within the excavations of the German DAI.<sup>35</sup> In the excavations of the University of Hamburg the classes (originals and imitations) are conspicuously absent within the not insignificant body of 10,193

counted diagnostic sherds.<sup>36</sup> The recent bilateral excavations on the Bir Massouda site 2 have yielded at least one other fragment of a juglet as Cat. 12, remarkably again in relation with the iron working installations. In context BM02/8231, which is the fill of hearth BM02/8232, a wall fragment with 4 concentric circles in reddish paint has been found (BM02/32565).

*Context BM02/8251 (Cat. 13; fig. 8f)*

This context is a levelling layer, which is situated directly below the yellowish preparation layer BM02/8245. It is described as a greyish black compact and clayish layer. The material included may date to the 8<sup>th</sup> or 7<sup>th</sup> century BC.

*Cat. 13: BM02/32600, profile fragment of cooking stand (fig. 8f)*

Clay KTS clay structure; diam. rim 10, diam. base 20, H 12 (15 with knob).

The rim fragment of a cooking stand finds parallels in the handmade pottery repertoire of the second half of the 8<sup>th</sup> to the first half of the 6<sup>th</sup> century BC (Mansel 1999, 231-232, fig. 5,54-55) and in the Punic Plain Ware as Vegas' Form 85.1 (Vegas 1999a, 214-215, fig. 128,1-2). Typical are ventilation holes and the knob, which had probably only been applied to one of the two ends. Earlier excavations of the University of Amsterdam in trench 8 have yielded few more contemporary specimens of these vessels, both in the Plain Ware and in the Handmade Ware.<sup>37</sup>

*Context BM02/8243 (Cat. 14; fig. 8e)*

The context lies to the east of BM02/8251 and more or less on the same level. It is separated from that levelling layer by an Archaic north-south wall BM00/8032+BM02/8209, which is bonded with the east-west wall BM02/8271 to its north. BM02/8243 is described as a grey rather loose earth with gravel. Its stratigraphical position is below BM02/8227, the yellow preparation layer for the metallurgical installations (fig. 4). Its contents may be dated to the 8<sup>th</sup> or 7<sup>th</sup> century BC.

*Cat. 14: BM02/32588, profile fragment of pot stand (fig. 8e)*

Clay KTS clay structure; diam. rim 16.5, diam. base 20, H 8.3.

The pot stand has in all likelihood been used for supporting amphorae in the household. Plain Ware versions like the present one are not uncommon in settlement contexts. This pot stand is of

shape A in my classification of these vessels (Dochter 1997, § VII.2.1.4.1, tab. 51A, figs. 279-282). In the recent classification of M. Vegas they occur as Form 45 (Vegas 1999a, 175-176, fig. 82). They are dated to the 7<sup>th</sup> and first quarter of the 6<sup>th</sup> centuries BC. In the University of Amsterdam excavations on the Bir Massouda site, a comparable Plain Ware stand was documented in context BM00/1121, the material of which is dated to the 7<sup>th</sup> and 6<sup>th</sup> centuries BC (BM00/17779; see Dochter forthcoming c).

#### II.B. A MIDDLE PUNIC CONTEXT FROM TRENCH 1 (CONTEXT BM02/1234; figs. 9-10)

*Babette Bechtold*

Context BM02/1234, a brownish-grey levelling layer, was found in a sequence of stratigraphical layers below a Late Punic terrazzo pavement (corridor: BM00/1050), excavated during the 2000 campaign of the University of Amsterdam. It was composed of 77 pottery fragments of 71 different vessels, 13 of which are discussed below, and represents a very homogeneous Middle Punic level with apparently no residual material. Dating elements are basically the Attic red figured *kylix* (Cat. 15; fig. 9a), the casserole Vegas' Form 68.1 (Cat. 20; fig. 9i) and the two Punic amphorae (Cat. 21-22; fig. 9f-g). Cat. 15 (fig. 9a) supplements the group of Attic red figured and painted vessels found in the excavations below the nearby *Decumanus Maximus* with another fragment. It characterises part of the Attic production exported especially to the Punic area during the last years of the 5<sup>th</sup> and first half of the 4<sup>th</sup> century BC. Although casseroles of Vegas' Form 68.1 seem to appear already in the first half of the 5<sup>th</sup> century BC levels, the evidence of the Hamburg excavations suggests that this type becomes particularly frequent after the middle of the 5<sup>th</sup> century BC and remains so till the first half of the 4<sup>th</sup> century BC. The same time range may be assigned to the two Punic amphorae (Cat. 21-22; fig. 9f-g), which find many comparisons in the end of the 5<sup>th</sup> and the first half of the 4<sup>th</sup> century BC. Also the Punic painted bowl of Vegas' Form 3.3 (Cat. 16; fig. 9b) and the jug of Vegas' Form 28 (Cat. 19; fig. 9e), the amphora lid (Cat. 25; fig. 9h) and possibly the two painted amphorae (Cat. 23-24; fig. 9j-k) fit in nicely in this Middle Punic pottery repertoire, whereas the lid (Cat. 17; fig. 9c) remains without convincing morphological comparisons.

The absence of Plain Ware pottery with smoothened surfaces,<sup>38</sup> on the one hand, and the abundance of Punic Painted Ware,<sup>39</sup> on the other,

together with the chronologies proposed for the diagnostic items, support a dating of context BM02/1234 within the first thirty years of the 4<sup>th</sup> century BC.

#### *Catalogue (figs. 9-10)*

##### ATTIC RED FIGURED WARE

*Cat. 15: BM02/32589, wall fragment of a kylix (figs. 9a, 10)*

Hard fired, very fine, reddish yellow clay (5 YR 7/8); high quality black glaze inside and outside, part of one reserved leave (?) on outside; H. 0.6.

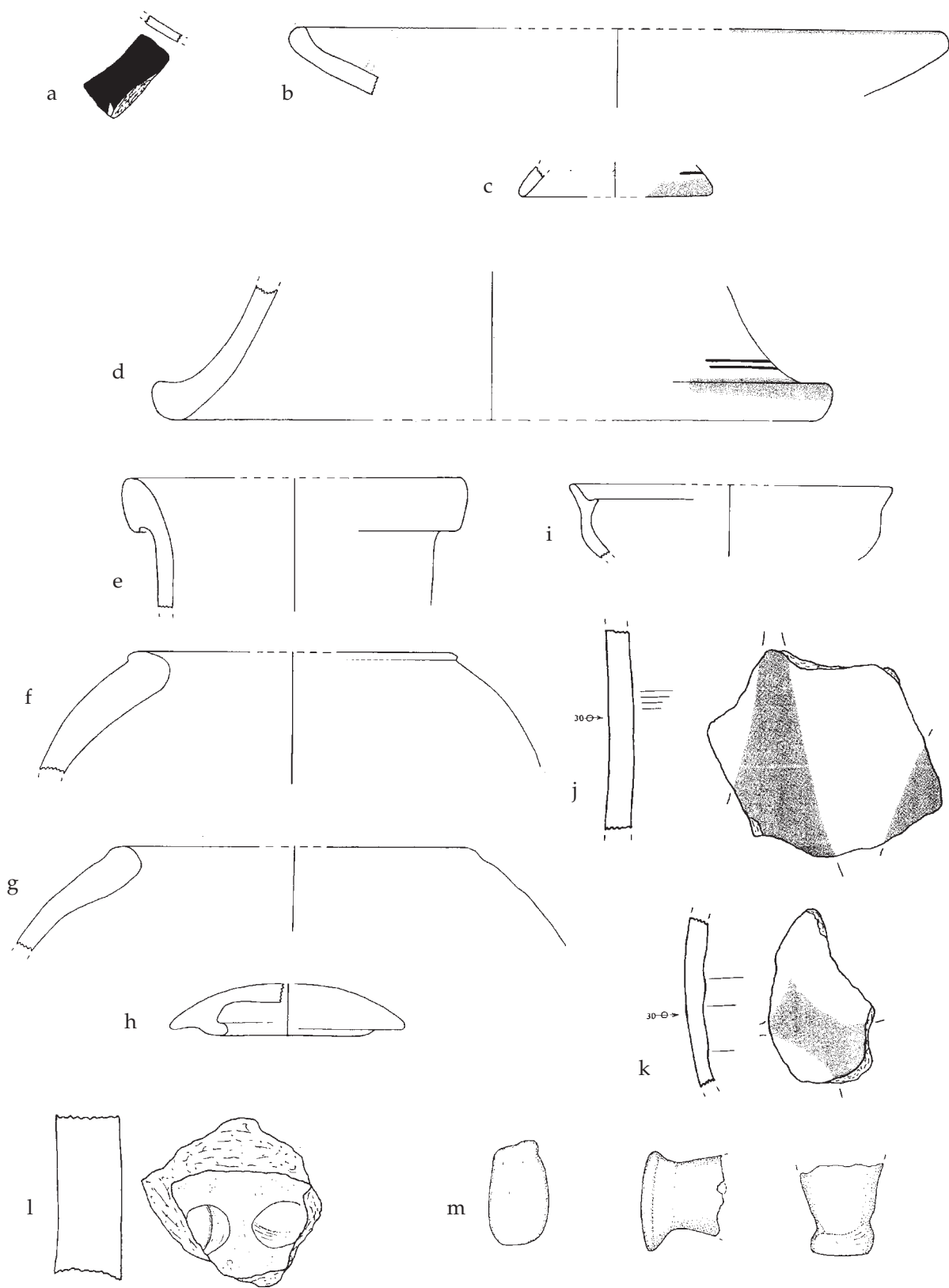
This Attic wall sherd is likely to belong to one of the red figured classes of the Late Classical production destined principally to the commerce with the non-Greek, western markets. The most famous example for this kind of trade is the El Sec shipwreck of the middle of the 4<sup>th</sup> century BC (cf. Trias 1987): 53 stemless cups attributed to the Painter of Vienna 116, the production of which had already been documented in Northern Africa at Tipasa, Lixus, Kouass, and Carthage itself. Some of the late Attic classes like the painted *skyphoi* of the classes Picazo I and II, red figured *skyphoi* attributed to the Fat Boy Painter and one *kylix* possibly of the Painter of Vienna 116 are well documented in the nearby Hamburg excavation with a total of 9 fragments (cf. Bechtold forthcoming c). They date to the late 5<sup>th</sup> and first half of the 4<sup>th</sup> centuries BC.

##### PUNIC PAINTED WARE, LOCAL FABRIC (KTS CLAY STRUCTURE)

*Cat. 16: BM02/32591, rim fragment of a large bowl of Vegas' Form 3.3. (figs. 9b, 10)*

Fairly hard fired, red clay (2.5 YR 5/6). Yellowish slip inside and outside. Reddish-brown painting on top of the rim and on the inside. Diam. rim c. 28, H. 2.8.

For the occurrence of the type at Carthage see Vegas 1999a, 142, fig. 31. The diam. of the rims range from 17 to 28cm. The bowls are generally provided with red or brown stripes. Although large bowls already appear in 6<sup>th</sup> century BC layers, it is only in the 5<sup>th</sup> century BC that the type becomes more common, thereafter it continues down to around the middle of the 4<sup>th</sup> century BC. From the Bir Massouda excavations come two other items of Vegas' Form 3.3: BM00/17817 from context BM00/1118 of the second-third quarter of the 5<sup>th</sup> century BC and BM00/17840 from context BM00/1110 of the late 5<sup>th</sup> century BC (cf. Bechtold forthcoming d).





Cat. 17: BM02/32590, rim fragment of a small-sized, conical lid (figs. 9c, 10)

Fairly hard fired, reddish yellow clay (5 YR 7/8), wide red painted band on rim on the outside with a single red line above. Diam. rim 8, H. 1.3.

Similar small-sized lids with painted lines, but with less steep body profiles define Vegas' Form 43.1 (Vegas 1999a, 174, fig. 78,3-4). They have rim diameters of 9 and 10.5cm, but stem from Archaic contexts. A clearly larger item, comparable in section, comes from a 4<sup>th</sup> to 3<sup>rd</sup> century BC level excavated in the 'Magon Quarter' near the coast in Punic house VI (Vegas 1991, 40-41, fig. 12,82): a very thin-walled Plain Ware vessel with a rim diameter of 22cm. Finally, in the Hamburg excavations below the *Decumanus Maximus*, a small painted lid was found in a level, which was disturbed in Roman times (cf. Bechtold forthcoming a: KA87/28-1).

Cat. 18: BM02/32592, base fragment of a pot stand of Vegas' Form 45/Docter's type C (figs. 9d, 10)

Hard fired, light red clay (2.5 YR 6/8). Large horizontal, red line on the upper part of the rim, above 2 thin, blackish lines. Diam. base 28.6, H. 5.7.

For the type cf. Vegas 1999a, 175-176, fig. 82, with diameters ranging between 17 and 22cm. According to Vegas stands destined to support amphorae and other large vessels with convex bases appear to be quite rare in Carthaginian settlement levels, while they are more numerous in 7<sup>th</sup> to 5<sup>th</sup> century BC graves outside the city. See also Docter's stand type C, defined by 2 double-conical shaped stands in Plain Ware from a Late Punic layer and therefore probably residual (Docter 1997, § VII.2.1.4.3, figs. 285-286). For the use of smaller, biconical stands in the 5<sup>th</sup> and first half of the 4<sup>th</sup> centuries BC on Kerkyra (Corfou),

Fig. 9. Context BM02/1234: a. wall fragment of a red figure kylix (Cat. 15); b. rim fragment of a large bowl Painted Ware (Cat. 16); c. rim fragment of conical lid Painted Ware (Cat. 17); d. base fragment of a pot stand 'red-and-black' Painted Ware (Cat. 18); e. rim fragment of jug (Cat. 19); f. rim fragment of Punic amphora (Cat. 21); g. rim fragment of Punic amphora from Sardinia (Cat. 22); h. rim fragment of a lid, imported (Cat. 25); i. rim fragment of casserole (Cat. 20); j-k. 2 wall fragments of painted transport amphorae (Cat. 23-24); l. wall fragment of tabouna (Cat. 26); m. fragment of horizontal grip, Handmade Ware, from left to right: front, section and top view (drawings by B. Bechtold, inked by J. Angenon).



Fig. 10. Context BM02/1234: all but two diagnostic fragments (Cat. 15-22, 25-27) (photo UGent/INP).



cf. Kourkoumelis-Rodostamos 1988, 138-140, fig. 18, b-d (Plain Ware).

Although the combination of red and black colours ('red-and-black') used in the decoration reminds of Archaic Bichrome Ware, it is also quite common in the repertoire of the 4<sup>th</sup> to 3<sup>rd</sup> century BC Painted Ware of Tharros (cf. Cotza 1997, 94). However, the Hamburg excavations below the *Decumanus Maximus* didn't yield more than 3 red-and-black painted fragments (from Archaic and Middle Punic levels).

PUNIC PLAIN WARE, LOCAL FABRIC (KTS CLAY STRUCTURE)  
*Cat. 19: BM02/32593, rim fragment of a jug of Vegas' Form 28 (figs. 9e, 10)*

Hard fired clay, light red at core (2.5 YR 6/6), white on surface (2.5 Y 8/2). Diam. rim 14, H. 5.5.

For the type cf. Vegas 1999a, 163, fig. 62, with rim diameters ranging from 8.5 to 12.5cm. The type appears in the course of the 6<sup>th</sup> century BC, but becomes particularly frequent during the 5<sup>th</sup> century BC; see esp. Vegas 1999a, 117, fig. 13, 25-26 from a context (no. 10) excavated in Rue Ibn Chabâat, of the last quarter of the 5<sup>th</sup> century BC. For the presence of this type at Mozia cf. Vecchio 2002, 220-221, pl. 15, 4, type 38 (considered an amphora), from levels of abandonment (period V = end of the 4<sup>th</sup>-3<sup>rd</sup> century BC). Here they may be residual.

PUNIC KITCHEN WARE, LOCAL FABRIC (KTS CLAY STRUCTURE)

*Cat. 20: BM02/32598, 3 joining rim fragments of a casserole of Vegas' Form 68.1 (figs. 9i, 10)*

Hard fired, reddish yellow clay (5 YR 6/6). Diam. rim 14, H. 3.2.

For the type cf. Vegas 1999a, 196, fig. 104, with rim diameters ranging from 12 to 29cm, mostly between 16 and 24cm. According to M. Vegas, Form 68.1, which imitates the Greek *lopades*, was in use during the 5<sup>th</sup> and 4<sup>th</sup> centuries BC. The stratigraphical data yielded by the excavations of the University of Hamburg suggest a slightly different, more recent occurrence of this form. Below the *Decumanus Maximus* these casseroles appear essentially in contexts of the second half of the 5<sup>th</sup> and the first half of the 4<sup>th</sup> centuries BC (cf. Bechtold forthcoming a).

AMPHORAE

*Cat. 21: BM02/32596, rim fragment of a Punic amphora of Ramón's type T-4.1.1.3 or Vegas' Form 75, local fabric (figs. 9f, 10)*

Fairly hard fired, white clay (2.5 Y 8/2), KTS clay structure. On its outer surface a blackish spot. Diam. rim 13, H. 5.2.

For the type cf. Ramón 1995, 185-186, fig. 38, 2 and fig. 158, 127-128. Although T-4.1.1.3 seems to represent a Sardinian production, it was certainly influenced by earlier, North-African types as T-4.1.1.2. The rim diameters range from 10 to 12cm; they are dated from the second half or the last third of the 5<sup>th</sup> to the beginning of the 4<sup>th</sup> century BC. In fact, in Carthage, amphorae T-4.1.1.3 of local fabric appear to be very numerous in 5<sup>th</sup> and 4<sup>th</sup> centuries BC levels excavated by the German DAI (cf. Vegas 1999a, 203-205, Form 75, figs. 14, 50, 114, 118, from one context [no. 10] in Rue Ibn Chabâat, dating to the last quarter of the 5<sup>th</sup> century BC). An overview of all published items suggests that T-4.1.1.3 characterises particularly Carthaginian levels of the second half of the 5<sup>th</sup> or the first half of the 4<sup>th</sup> century BC: Bechtold forthcoming b, 3 fragments from contexts dated to this period; Vegas 1987, 398, fig. 8, 152, from layer 21 of the end of the 5<sup>th</sup> and beginning of the 4<sup>th</sup> centuries BC; Vegas 1991, 44, fig. 14, 150, from Punic house VI, corridor P30, level p4, of the 4<sup>th</sup> century BC. For the occurrence of amphorae T-4.1.1.3 of North-African fabric at Sabratha, cf. Keay 1989, 18, Middle Punic sub-type 4d, fig. 5, 55. Type T-4.1.1.3. was produced on Middle Punic Mozia as well, but probably not in large numbers (Toti 2002, 288-298, pl. 12): only 10 fragments of certainly local fabric were recorded among the more than 1000 inventoried pieces. They generally date to layers of the period of abandonment (period V = end of the 4<sup>th</sup> to 3<sup>rd</sup> centuries BC).

*Cat. 22: BM02/32597, 4 joining rim fragments of a Punic amphora as Ramón T-4.1.1.3/T-4.2.1.2, imported fabric (Sardinia; figs. 9g, 10)*

Hard fired, reddish yellow clay (5 YR 6/8), tempered with a lot of quartz and whitish stone parts. Part of the external and internal surface seems to be covered by a greyish slip. Diam. rim 14.6, H. 4.5.

According to Ramón, amphorae of his type T-4.1.1.3 show a sort of step, externally separating the rim from the shoulder (cf. Ramón 1995, 185-186, fig. 38, 1). The properties of the clay of the present fragment might correspond to J. Ramón's group 'Sardinia' (cf. Ramón 1995, 261). Similar items have been found on Sardinia, in grave 12 of the Southern cemetery of Tharros (cf. Molina Fajardo 1984, 86, fig. 12, 1). This portion of the cemetery was mainly in use during the 5<sup>th</sup> and 4<sup>th</sup> centuries BC (Molina Fajardo 1984, 89). Other fragments have been found in room 38 of Monte Sirai (Botto 1994, 93, fig. 5, b-c). but in these cases with micaceous inclusions, and corresponding to Bartoloni's amphora type D4 (Bartoloni 1988, 47,

fig. 9), dating to the 5<sup>th</sup> and beginning of the 4<sup>th</sup> centuries BC (Botto 1994, 108-109). Morphological similarities can also be found with T-4.2.1.2 (cf. Ramón 1995, 188, fig. 160). Here, the rim simply constitutes simply the continuation of the wall and seems just slightly thickened. The rim diameters range from 12 to 14cm. They belong to 4<sup>th</sup> century BC productions of Carthage/Tunisia and/or western Sicily. For Carthage, once again a good comparison stems from a context (no. 10) of Rue Ibn Chabâat, dating to the last quarter of the 5<sup>th</sup> century BC (cf. Vegas 1999a, 118, fig. 14,54).

#### PAINTED AMPHORAE

*Cat. 23: BM02/33402, wall fragment of an amphora, painted, KTS clay structure (fig. 9j)*

Hard fired, pale brown clay (10 YR 6/3), surface light grey scum (10 YR 7/2) with greyish brown painted decoration (10 YR 5/2). Dimensions 4.9 x 7.2.

*Cat. 24: BM02/33403, wall fragment of an amphora, painted, KTS clay structure (fig. 9k)*

Hard fired, light red clay (2.5 YR 6/6) with brown core (7.5 YR 5/2), surface light grey scum (10 YR 7/2) with greyish brown painted decoration (10 YR 5/2). Interior blackened. Dimensions 9.2 x 10.5.

The fragments of two different amphorae have been painted in light gray tones. The three clearly diverging rays painted on the external surface of Cat. 23 are likely to represent a lotus flower, symbol of Egyptian origin and alluding to rebirth after death. The representation of the lotus flower appears to be quite common in the 4<sup>th</sup> century BC decorative repertoire of the local workshops of Tharros (Sardinia). Here, several huge closed vessels, especially table amphorae with sloping shoulders, reveal more or less simplified lotus flowers, generally with three but sometimes with five petals and painted in red (Cotza 1997, 87-89, fig. 1a-b with more literature for Tharros in note 15). A 4<sup>th</sup> century BC dating corresponds perfectly with the data yielded by the Carthaginian excavations below the nearby *Decumanus Maximus*, where painted motives other than horizontal lines are particularly typical of 4<sup>th</sup> century BC levels (Bechtold forthcoming a). According to E. Cotza (Cotza 1997, 94-95) the inspiration of decorative subjects used in the East, in Greece as well as in Egypt, reaches Sardinia through Carthage, which assumed the function as a sort of distribution centre for the West. In view of this special role in the transmission of artistic repertoires, the presence of the lotus flower motive on painted amphorae of

Carthaginian fabric acquires a special significance. A second wall fragment of a local amphora with three painted rays, which are possibly the remains of a lotus flower (BM00/16336), had been found during the excavation campaign of 2000 in trench 6, context BM00/6053, deposited during the Early Imperial period but mainly containing Late Punic material. The painting of transport amphorae in this manner, however, remains actually without parallels in the published record of Carthage.

#### AMPHORA LID

*Cat. 25: BM02/32594, rim fragment of a lid, imported fabric (figs. 9h, 10)*

Hard fired, light brownish grey clay (2.5 Y 6/2), tempered with a lot of tiny bits of quartz and small red particles. Surfaces smoothened, light yellow slip inside and outside. On the external surface traces of firing. Diam. rim 5.6, H. 2.2.

A nice morphological parallel comes from the Hellenistic cemetery of Punic Lilybaeum (Bisi 1971, 734, fig. 72 b), grave 40 of property Tumbarello (first quarter of the 3<sup>rd</sup> century BC, dating proposed by the present author), here defined as a rather small plate with a rim diameter of 8.2, possibly of local fabric. For one more comparison from western Sicily, Erice, see Zirone 1999, 50, saggio IIIbis, N. I. 40181, diam. base 8.8, apparently belonging to the Hellenistic period. The only vessel type identified among the Mozia material which was clearly provided with a lid was the amphora corresponding to Ramón's type T-4.2.2.6, of certain West Sicilian fabric (Solunto, but Mozia as well; cf. now Toti 2002, 285-287, pl. 11,10), type 13 of the Mozia amphorae dated to the 4<sup>th</sup> century BC. Another early Hellenistic lid with similar profile was found in Corinth, cf. Edwards 1975, 106, pl. 19, No. 609, *stamnos* lid II, early stage, c. 300 BC, diam. base 16.2, '... made ... with care, of heavy clay, and covered on both surfaces with slip.' The general shape of Cat. 25 reminds one, however, of Late Punic lids of Vegas' Form 81 (cf. Vegas 1999a, 210, fig. 122).

#### TABOUNA, LOCAL FABRIC (KTS CLAY STRUCTURE)

*Cat. 26: BM02/32595, wall fragment, decorated by two finger imprints (fig. 9l, 10)*

Hard fired, reddish yellow clay (5 YR 7/8), internal surface smoothened. Inside burnt by the effect of exposure to fire (primary use). c. 7.7 x 7.3, H. 7.3.

The occurrence of *tabouna*-furnaces at Carthage can be traced from the late 8<sup>th</sup> century BC down to the 5<sup>th</sup> century BC (cf. Bechtold forthcoming d; Mansel 1999, 232-233, fig. 5,56-58). In a levelling layer excavated in trench 8 of the Bir Massouda

site, which is dated to the second or third quarter of the 5<sup>th</sup> century BC, 12 fragments of such vessels were found: cf. contexts BM00/8057 and BM00/8058 (Bechtold forthcoming d). L. Campanella shows in a recent contribution that at least in Sardinia *tabouna*-furnaces seem to have been in use from the Archaic period down to the 2<sup>nd</sup> century BC (cf. Campanella 2001, esp. 239; also Mansel 1999, 233, note 72).

#### HAND-MADE WARE

Cat. 27: BM02/32599, fragment of a horizontal grip (figs. 9m, 10)

Weak fired, reddish yellow clay (5 YR 6/6). Hole drilled horizontally through grip before firing. Both horizontal surfaces burnt (primary use?). c. 3.5x4.2.

The grip of this handmade vessel remains without parallel in the published record of Carthage, which is hardly surprising given the lack of attention paid to this class of pottery (see however Mansel 1999). It is not to be excluded that the handle belonged to a cooking vessel.

#### II.C. SOME ARCHAEOZOOLOGICAL OBSERVATIONS ON MIDDLE PUNIC CONTEXT BM02/1234<sup>40</sup>

Wim Van Neer

The number of faunal remains from this context is very small but the advantage is that they form an assemblage that is well dated to the first thirty years of the 4<sup>th</sup> century BC with apparently no residual material. Two limpets are identifiable as *Patella rustica*, whereas a small fragment of a *Muricidae* could not be brought to species.<sup>41</sup> Among the mammal remains, about 20 unidentifiable fragments occurred that mainly belong to the size class of sheep and goat. One fragment was clearly from a larger species, most probably cattle. All eight identifiable bones from this context are from ovicaprids, but none of them showed diagnostic criteria allowing the distinction between sheep and goat. One proximal metacarpal fragment, 3 incomplete ribs and a vertebra fragment did not allow age estimates of the corresponding animals. A lower jaw of sheep or goat does not yet have its last molar erupted, indicating that the mandible belongs to an individual between 1 and 1.5 years old. An older individual is represented by a proximal femur of which the articular end (the *caput*) is fusing, a process that happens between 3 to 3.5 years of age. Finally, a very young animal of less than 4 months is indicated by a radius fragment of which the proximal epiphysis is still unfused.<sup>42</sup>

It is clear that more extensive samples will be needed to provide a detailed picture of the food provisioning during Middle Punic times. The archaeozoological data that are thus far available for Carthage deal mainly with the Roman, Vandal and Byzantine periods. Pre-Roman material has been described only from excavations carried out by the University of Hamburg (Weinstock 1995) and the German Archaeological Institute (Nobis 1999).<sup>43</sup> Throughout the whole occupation of Carthage the major meat resources were cattle, sheep, goat and pig, but proportions changed through time. J. Weinstock (1995) observed a heavy reliance on cattle and sheep/goat during Punic times whence pigs were of minor importance, and noticed an increase in number of pigs slaughtered in Roman times (at that time approximately 10% of the consumed domestic animals). G. Nobis (1999), however, found much larger amounts of pig bones (21% for the Middle and Late Punic periods, and 56% in Roman times). The diachronic changes in pig consumption have been explained in terms of food habits of the inhabitants of Phoenician and non-Phoenician origin. The observed increase in pig remains through time could be an indication that the number of pork-loving foreigners inhabiting the city increased as the town grew or that there was an acculturation of the Semitic inhabitants. The great difference in the contribution of pig found by the two aforementioned authors for similar periods indicates, however, that spatial distribution within the city may play a role as well. Therefore contextual analysis may be helpful in the future to establish to what extent food habits from individual households of a different ethnic origin can play a role in the observed patterns. When looking at context BM02/1234, which probably represents a garbage assemblage of a Middle Punic household in this part of Carthage (used to raise a floor level in a domestic area), it may perhaps be significant that there is no clear evidence for pork consumption.

#### II.D. PRELIMINARY THOUGHTS ON BELLOWS' PIPES AND NEEDLES<sup>44</sup>

Hans Koens

##### Introduction

A large number of bellows' pipes ('tuyères'; figs. 11-12) and some needles came to light during the excavations of spring 2002. Both classes of objects served humble purposes in antiquity and both classes are still not very well studied and published.<sup>45</sup> This is not justified, since the first class is



very interesting from a metallurgical, and the second one from a production technical point of view.

The present observations serve as a preliminary report. The finds will be analysed and discussed in the wider perspective of the metallurgical objects, which were found on the Bir Massouda site during the excavations of the years

2000 and 2001. Here I will confine myself to a short overview of the development from a fan to a bellows' pipe, illustrated on the basis of the recent finds. Moreover, some of the Bir Massouda needles will be discussed in the light of the two different production processes of these utensils.

### *Bellows' pipes (figs. 11-12)*

For a proper understanding of the function of a bellows' pipe, it is necessary to start with a discussion of the different furnace types (Davey 1979; Tylecote 1981).

#### *Furnaces with a natural draught*

The first archaeological proofs for pyro-technological activities are the pottery kilns. These furnaces or kilns make use of natural draught, which is created by the difference in density between the rising hot air and the incoming cold air. The earliest kilns only had a firing chamber, in which the pottery was placed together with the firewood.<sup>46</sup> Later types were provided with a separate combustion chamber (firing box) and firing chamber. By manipulating the air flow through the kiln, one could create either an oxidizing or a reducing atmosphere in the firing chamber. There is little doubt that the latter type of kiln was used in the first experiments to reduce copper ore into copper.<sup>47</sup> Still, it is only possible under very exceptional circumstances to reach temperatures of more than 1000°C in these kilns at a reducing atmosphere.<sup>48</sup>

The temperature, which was sought after for most of the metal production-, refining- and working- processes, is higher than 1000°C.<sup>49</sup> Consequently, all 'ancient' pyro-technical installations that were used to these ends must have made use of a forced air input.

#### *Furnaces with a forced air input*

Archaeologically there is general acceptance that the fan and the bellow are the first utensils manipulated by the blacksmith to raise the temperature of the smouldering charcoal.<sup>50</sup> Although the fan had been used regularly in the Near East, the bellow with the bellows' pipe are much more practical. It gives a stronger and better-directed airflow, by which means the melting point of gold or copper can be reached in the furnace or crucible. The oldest known representations of the use of bellows' pipes in a metallurgical process are found in the tomb of Ti, a high official of the Fifth Dynasty (c. 2600 BC), near Saqqarah, Egypt (Zwicker *et alii* 1985, 110, figs. 2, 4-6, 8).

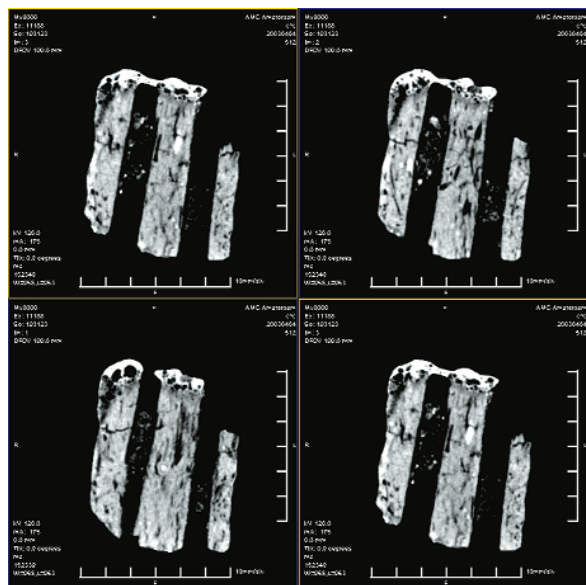


Fig. 11. Bellow's pipe BM00/30191 from context BM00/8091 (CT-Scan).

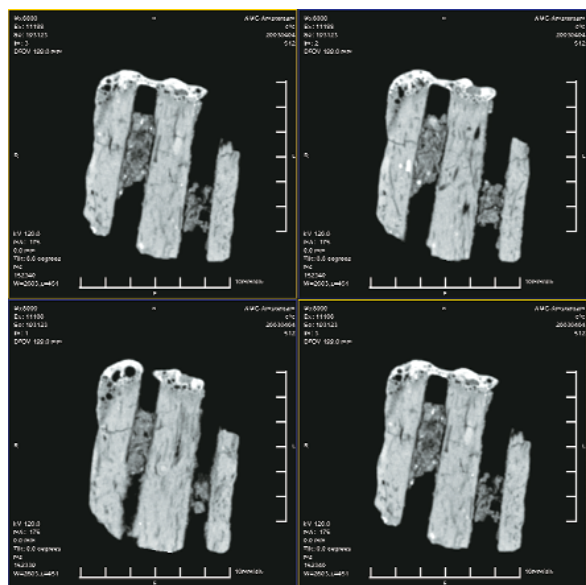


Fig. 12. Bellow's pipe BM02/30196 from context BM02/8217 (CT-Scan).



Human's lungs can move 40 litres of air per minute for a short period of time, but if doing so for longer periods, the volume moved per minute is only 15 to 20 litres.<sup>51</sup> This air volume suffices to maintain the high temperature in a small furnace, but for a larger one forced air input is imperative. The need for a higher production in larger furnaces has probably caused the introduction of the bellows' pipe.<sup>52</sup>

Various authors, particularly W. Foy and K. Klosemann, have described the development of the bellows' pipe.<sup>53</sup> The first bellows had been made of animal skins, often the skin of juvenile goat. The skin was sawn together and provided with two parallel incisions, in which the feet would fit. In this way, the bellow could not only be lifted, but also could the (bare) foot serve as an air valve. A wooden pipe was fixed into one of the skins' legs and tied off in an airtight way. The air supply from this pipe reached the interior of the furnace by means of a bellows' pipe incorporated into its wall.

#### *Purpose of the bellows' pipe*

Bellows' pipes are made of heavily tempered clay and in many different shapes. Normally, however, they are rounded or block-shaped, although oval or conical shapes do occur. In most cases, they are straight, but some bellows' pipes show an angle of some 90 degrees. The dimensions may differ: lengths of only few centimetres to some decimetres and heights of 5 to 15cm. All bellows' pipes have one or more air holes with appropriate diameters of 1.5 to 2.5cm. The end, which remains outside the furnace, is always slightly funnel-shaped, to allow the pipe of the bellow to be fixed airtight. Most bellows' pipes are only crudely shaped handmade objects, but there are some which have been made carefully on the potter's wheel and which may even be decorated with incisions.<sup>54</sup> Mostly, the handmade bellows' pipes only sun-dried before being put into use.

Bellows' pipes are hardly ever found intact. The ends, which remained in the furnace and are consequently fired more or less by accident, are normally the best-preserved - and best-recognised - parts. Their surfaces are glazed and in some cases traces are visible of ash- and metal slag.

#### *Bellows' pipes as source of information*

It is hard to distinguish in the slag material, which is formed during the metallurgical processes, between residues from production and working, not even by intensive chemical analyses. Especially iron slag belongs to a group, where this is even

almost impossible, so that other indications should provide solutions for making this distinction.<sup>55</sup> One very important object, used in the reconstruction of the metallurgical process, is the bellows' pipe. Distinguishing in different types may betray the type of process, which took place in antiquity, in particular on the Bir Massouda site.

#### *Iron production*

The amount of air, which is necessary for an ancient iron production furnace with an internal diameter of 30cm to function, is 62 litres.<sup>56</sup> If one would have added more air, the amount of slag created during the production process would rise, and, because of the decreasing reducing atmosphere in the furnace, the iron yield would decrease considerably.

The capacity of the skin of a juvenile goat is in the range of 10 to 12 litres.<sup>57</sup> When used as a bellow at an easy pace of 6 or 7 movements per minute,<sup>58</sup> the required amount of air would be blown into the furnace. In conclusion, for iron production it would have been sufficient to use bellows' pipes provided with only one air channel.

#### *Iron working*

When working the bloom into iron utensils, a reducing atmosphere within the hearth is of lesser importance. In order to work fast and efficiently, the blacksmith needed to blow up the fire in the hearth to high temperatures within a very short period of time, preferably on a surface as wide as possible. To enable this, he needed to blow a high amount of air into the fire, within that very short period of time. To this end, he used two bellows, which were operated by hand (Friede/Steel 1975, 221-231). In conclusion, the bellows' pipes used in the working of iron had been provided by two air channels. These are the versions found in the West Phoenician world (several sites in Spain as well as Carthage) and on Greek Pithekoussai (Ischia).<sup>59</sup>

#### *Bellows' pipes on the Bir Massouda site (figs. 11-12)*

Although bellows' pipes are only strictly functional objects with no intrinsic or aesthetical value whatsoever, their development and typology is interesting, because they may provide valuable information on the metallurgical processes, for which they were used. Within the finds from the Bir Massouda site the following pattern emerges. All bellows' pipes are provided with two air channels. If one looks at their dimensions, though, the Carthaginian ones can be distinguished into two types:

Type I: dimensions (approximate length x width x height) = 8x5.5x4cm.  
diam. of air channels = 1x1.2cm.

e.g. BM00/30191 from context BM00/8091 (fig. 11)

Type II: dimensions (approximate length x width x height) = 11x6.5x6cm.

diam. of air channels = 1.4x1.6cm.

e.g. BM02/30196 from context BM02/8217 (fig. 12, cf. fig. 3)

Although it is most likely that the two types of bellows' pipes were used for two different processes, more research is needed to confirm this assumption.

*Note on the thermal properties of preparation layer BM02/8227 (fig. 4)*

The metal working installations found on the Bir Massouda site were prepared by a rather sterile compact yellowish clayish layer, which covered the older levelling layers. This layer has been excavated in different parts of trench 8, so e.g. as BM02/8245 (see above, the contribution of R.F. Docter and B.M. Telmini) and BM02/8227 (on its position see also above; fig. 4). Also in trench 7 a similar layer was found (context BM02/7238: see above, F. Chelbi and B.M. Telmini). A sample from context BM02/8227 could be analysed so as to establish its properties. Because also another metallurgical workshop area in Carthage, on the

Byrsa Hill, had been provided with such a layer (see above), the obvious explanation for its deposition would be that it related functionally to the workshop's procedure. But what procedure precisely? In order to find an answer to this question, the sample was analysed and the results confronted with some general physical and geological laws. What follows are some preliminary observations and explanations.

Soils are classed according to standardized grain sizes (Melhorn *et alii* 1962, 5, 11):

Very coarse	2	- 1 mm
Coarse	1	- 0.5 mm
Medium	0.5	- 0.25 mm
Fine	0.25	- 0.1 mm
Very fine	0.1	- 0.05 mm
Silt	0.05	- 0.002 mm
Clay	< 0.002	mm

Clay contains many quartz ( $\text{SiO}_2$ ), heavy clay up to 40% and light clays even up to 40-60%. Clays with more than 60% quartz are called sandy or mild clays. From about 10% moisture on, the water films around particles form a continuous sheet over the internal soil surface and take part in the heat transmission by water movement in the film phase (Martin 1962, 33). It is, therefore, of the highest importance that the degree of humidity in the clay will not surpass this 10% level, and if it does, that the period remains as short as possible. It follows that the thermal prop-

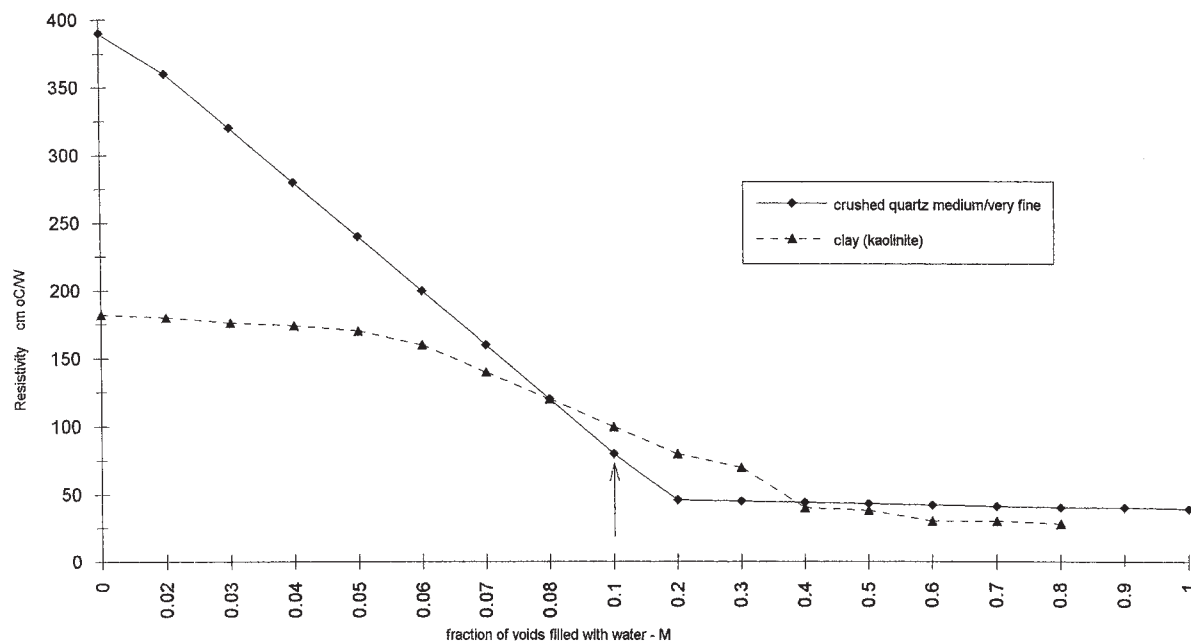


Fig. 13. Diagram showing the resistivity versus the moisture content of sample BM02/8227 (H. Koens, based on Winterkorn 1962).

erties are not so much to be found in the material itself as in the external circumstances (degree of humidity). These circumstances can be influenced by e.g. the grain size, the material of which the surrounding layer is composed, and the temperature to which the material is exposed.

The clay around the hearths, containing a considerable percentage of quartz, will inevitably be fired. As a result, the quartz-clay composition loses its thermal resistivity, because 'massive' quartz is a notorious bad heat-insulation. The melting point of quartz ( $\text{SiO}_2$ ) lies between 1150 and 1420°C, depending on its composition. Once the clay, containing a high amount of quartz, nearest to the fire has reached such a temperature, a thin layer of molten massive quartz will be formed, the thickness of which can be neglected and so its conductivity. Quartz with an 'ideal' grain size of 0.05-0.5mm (= very fine - medium), however, has perfect heat-insulating capacities, if only the degree of humidity remains below 10% (fig. 13).<sup>60</sup> This critical level of humidity will hardly ever be reached in the clay-quartz composition in such grain sizes, because they tend to allow for quick passage of water, enhanced by the capillary effect of the clay below it. The analyses on the clay sample of BM02/8227 have shown that the grain size of the quartz within the clay composition falls exactly within the very fine to medium range.

One may conclude that by using this heat-insulating layer, the Phoenician smith was not only able to reach a higher temperature in the hearth, but also saved a lot of firing wood. Further research on this subject is hoped to offer some statistics on the efficiency of both elements.

#### *Metal objects: the case of needles (fig. 14)*

The metal objects, which were found during the excavations on the Bir Massouda site, have been temporarily moved to the Netherlands for conservation and restoration measures in the laboratory of the Allard Pierson Museum (University of Amsterdam).<sup>61</sup> In the context of this preliminary report it is appropriate to present a few examples of a humble class of objects regularly found in excavations, especially in Carthage: needles (fig. 14). When found, they are mostly broken, bent or lacking their eyes. Nevertheless, the remains provide us with important information on the production techniques of these metal objects.

Needles occur in varying diameters. The smallest had probably been used for sewing or repairing cloths, the heavier examples for the working

of leather. Alternatively, these may even have been parts of fibulae or cloth pins. Since their shape is hardly changing through time,<sup>62</sup> and, consequently, establishing a typology on the basis of the finds from the Bir Massouda site would hardly be worth the effort, the study of their way of production is much more rewarding.<sup>63</sup>

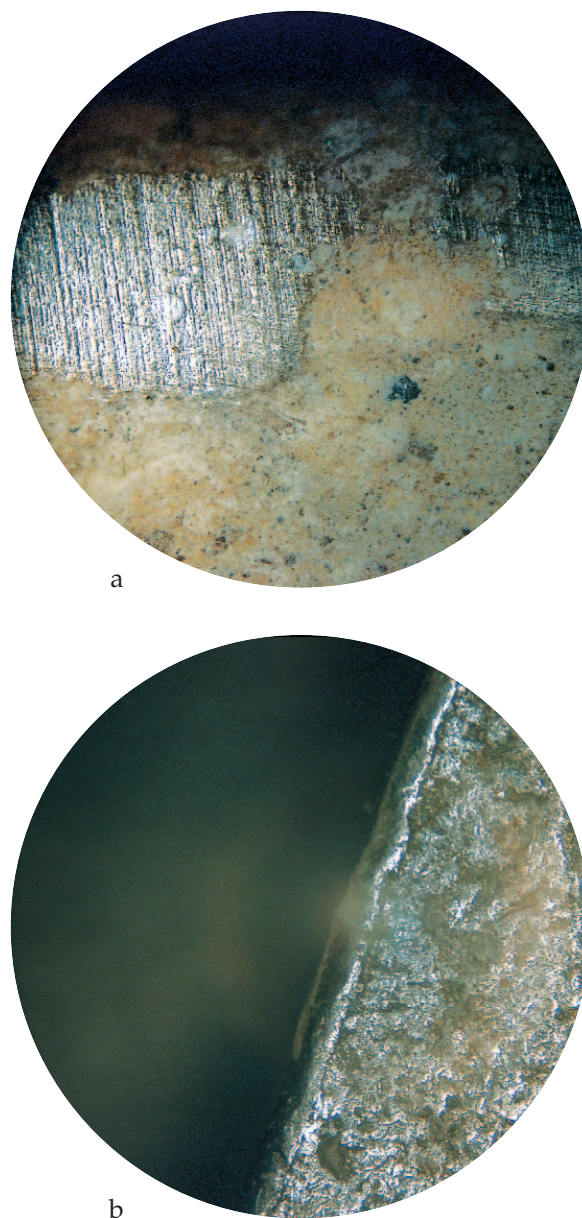


Fig. 14. Bronze needles (magnifying factor 125): a) BM02/32226 from context BM02/8239, made by the 'draw-die and drew-plate' method; b) BM02/32293 from context BM02/8234, hammered.



### Production methods

By microscopically investigating the needles it could be established that two different methods of production had been in use. The choice for either application had principally been dictated by the resulting diameter of the shaft.

Needles with small diameters (< 1.5mm) were made by the so-called 'draw-die and drew-plate' method (fig. 14a). Here, a crudely prepared bronze wire was pulled through a series of conical holes of diminishing diameters in a metal plate. The result is a very smooth, round and regular wire of one single diameter. Thereafter, making a point and an eye finished the needle. This production method didn't pose any restrictions to either the length or the diameter (till about 1.5mm) and the finished product was always of a high quality.

The 'draw-die and drew-plate' method was useless for needles with diameters larger than 1.5mm. The physical strength of the needle maker, or any normal human being, is simply insufficient. Such needles with a large shaft were hammered from crudely prepared bronze wires and, although they used to be made with high craftsmanship, their surfaces betray the production method by their irregularity, at least under a microscope (fig. 14b). Moreover, these needles are generally more oval in diameter and less resilient than the smaller 'drawn' needles.

### NOTES

- <sup>1</sup> The excavation has been made possible on the Belgian side by a generous grant of the Faculty of Arts of Ghent University and two travel grants of the Tunisian National Tourist Office (Amsterdam). I thank its staff M. Fersi and A. Lamers for their support. Fortis Bank Global Markets facilitated the project by the kind donation of two laptop computers. The Institut National du Patrimoine signed financially and logistically for the Tunisian side of the bilateral project.
- <sup>2</sup> These excavations took place in the months July and August 1988 in cooperation with Ahmed Ferjaoui and Taoufik Redissi, see Chelbi forthcoming.
- <sup>3</sup> Niemeyer/Docter *et alii* 1993; Niemeyer/Docter, Rindelaub 1995; Rindelaub/Schmidt 1995; Niemeyer/Rindelaub/Schmidt 1996; Niemeyer/Docter *et alii* 2002; Niemeyer *et alii* forthcoming.
- <sup>4</sup> Docter 2000; Docter 2001; Docter forthcoming b; Docter forthcoming d; Docter forthcoming e.
- <sup>5</sup> The identification of the layer as composed of hammer-scales was made by H. Koens after analysing a sample.
- <sup>6</sup> See Niemeyer/Docter *et alii* 1993, 206, note 16; Niemeyer *et alii* forthcoming. Please, note that the elevation mentioned in Niemeyer 1987, 8, has been corrected since.
- <sup>7</sup> Rakob 1987, esp. fig. 3,K, pl. 146,2; Rakob 1991, 165-174, 228-238, figs. 32-34, Beilagen 3 and 34; Rakob 2002, 18-19, 21, 36, fig. 3, pl. I,1.
- <sup>8</sup> In connection with a layer dated to 680-650 BC: González 1998, 57-59; González/Ruiz/García 1999, 269.

- <sup>9</sup> Docter forthcoming d; Docter forthcoming e; Chelbi/Telmini/Docter forthcoming.
- <sup>10</sup> From June 20<sup>th</sup> till July 7<sup>th</sup> 2002 and mid September 2002 till January 30<sup>th</sup> 2003.
- <sup>11</sup> Bénichou-Safar 1982, 325; Cintas 1976, 250; Lancel 1992, 66-67, 241.
- <sup>12</sup> De Jong forthcoming; Fersi/Nacef forthcoming.
- <sup>13</sup> It is to be noted that the majority of these fragments show traces of firing.
- <sup>14</sup> The identification of the material has been made jointly with L. Fersi, S. Garsallah and R.F. Docter.
- <sup>15</sup> If this identification proofs correct, it would be the earliest sign of Tanit found in Carthage.
- <sup>16</sup> Alternatively, one could think of planting holes in relation with an agricultural use of the terrain, but lacking any traces of a fertile agricultural layer on top, it seems improbably that a farmer would cut holes in the bedrock to plant his vines.
- <sup>17</sup> The bone material has been kindly screened by S. Roudesli Chebbi. Unfortunately, no traces of human bones were encountered, but in the case of cremations the small and friable bone remains may easily have escaped notice. For the next seasons intensive sieving procedures are foreseen.
- <sup>18</sup> Some conventions: Stratigraphical units in the excavation are called contexts. Context numbers are composed of unique four digit numbers, of which the first indicates the trench number, preceded by the letters BM, short for Bir Massouda, and the year. So, BM02/8210 means: Bir Massouda campaign of the year 2002, context 8210, which is situated in trench 8. Single find numbers, assigned to individual excavated finds, start from the same prefix BM02 (or BM00, BM01, if relating to finds of the years 2000 and 2001, respectively), followed by a unique five digit number, so e.g. BM02/32205 (see below, Cat. 1). KTS clay structure (German: 'Karthago Ton Struktur') is the typical local fabric of the Carthaginian coastal area, characterized by many well-sorted rounded quartz inclusions. The colour descriptions in the catalogue, below, follow *Munsell Soil Color Charts*, Baltimore 1975.
- <sup>19</sup> R.F. Docter is responsible for the descriptions and comments on the finds. Together with B.M. Telmini, who was in charge of the team working in trench 8 during the spring campaign, the sections on the archaeological contexts were formulated. L.P. du Piéd (Amsterdam) is to be thanked for commenting on some of the pieces.
- <sup>20</sup> B.M. Telmini was responsible for the day-to-day excavation and documentation of this particular sector of trench 8. The material lying just on top of BM02/8210, perhaps contaminated with recent material, was taken off and collected as BM02/8200.
- <sup>21</sup> The attribution of the stone was kindly made upon autopsy by P. De Paepe (Department of Geology of Ghent University, February 2003).
- <sup>22</sup> Vegas 1999a, 150, fig. 43,1-3 (F. 12); Vegas 2000, 358-359, fig. 3,17 (4 fragments from 1 context); Briese/Docter 2002, 193, 201, 215-216, figs. 19-20, pls. III-V; Docter forthcoming c (2 pieces: BM00/17792 from context BM00/1121 and BM00/15994 from context BM00/8031).
- <sup>23</sup> Vegas 1984, 218, 226, 228, 230, fig. 1,1; Vegas 1986-1989, 357, 359-360, fig. 2,10; Vegas 1989, 225, n. 66; Vegas 1992, 183, 187-188, fig. 5,10; Von Hase 1989, 372, n. 188a; Docter, Niemeyer 1994, 104-106, Cat. 4; Vegas 2002a, 138-139, fig. 139,13. The reconstruction drawing of this piece, which has been republished various times, is incorrect.



- <sup>24</sup> Docter/Niemeyer 1994, 105-106, Cat. 8-10, figs. 3b-c, e, 4a (captions have been mixed up); Rindelaub/Schmidt 1995, 47, fig. 4b-c, e, Cat. 9; Niemeyer/Rindelaub/Schmidt 1996, 50, Cat. 8; Docter forthcoming a, Cat. 4192-4195 and perhaps Cat. 4196.
- <sup>25</sup> See Briese 1998, 437-439, 448, Cat. 8-9, fig. 5, pl. 37,1-2, with references; Briese/Docter 2002, 201, fig. 20, pls. IV-V.
- <sup>26</sup> Vallet/Villard 1952, 327-328, fig. 1; Coldstream 1968, 102-104; Neeft 1981, 8-11; Benson 1989, 16-17.
- <sup>27</sup> Neeft 1981, 10, 56; chemically the difference with Corinthian wares is more difficult to establish.
- <sup>28</sup> Neeft 1981, 57, n. 213; Morgan 1988; Morgan 1995, 325, n. 25; Morgan 1999, 217-220.
- <sup>29</sup> Docter 1997, § VII.2, VIII.2-3, tab. 44-47, 61-62, fig. 581.
- <sup>30</sup> In the material from the excavations of the University of Hamburg below the *Decumanus Maximus*, e.g., coming from the field seasons 1986-1993, only 22 diagnostic fragments of such vessels were found (Docter 1997, tab. 43, 62b, figs. 254-256, 260-271, 274-275, 379). Apart from that 23 wall fragments, which may even have belonged to the vessels just mentioned, were recorded (B. Bechtold, personal comment). See n. 36, below, on the statistics.
- <sup>31</sup> See esp. Docter forthcoming e, with fig. 9 = BM00/17216 from context BM00/8092; Docter forthcoming c.
- <sup>32</sup> To the eye, the clay looks very similar to the typical local fabric of Carthage (KTS), but detailed study is needed to confirm this, especially since the closest parallels for the shape seem to be found in the East.
- <sup>33</sup> Lancel 1982, 222-223, 225-226 figs. 286-287 (layer 3a: '... d'une épaisseur comprise entre 20 et 25cm, régulièrement disposée, jaune et sablonneuse, est assez pauvre en matériel archéologique. Elle présente un plan supérieur sensiblement horizontal: on peut y reconnaître une couche de nivellement établie pour la mise en place des ateliers métallurgiques.').
- <sup>34</sup> See note 32, above.
- <sup>35</sup> Vegas 1989, 219, 222, fig. 2,24-25 (large sections of two jugs, which can only with some reservation be attributed to Cyprus. They originate in two contexts of the second half of the 8<sup>th</sup> century BC or slightly earlier in the Rue Septime Sévère: K87/90+91+92 and K87/15a); Vegas 1997, 354 (on the fragment mentioned in the present footnote); Vegas 1999b, 398, 401, fig. 6,5 (White Painted III or IV Ware from fill K94/1 [no. K94/T1.121] below a house floor in the Rue Ibn Chabâat, with finds mainly dating to the first half of the 7<sup>th</sup> century BC); Vegas 2002a, 135, 142, 144-145, fig. 4,40-42 (respectively a White Painted IV Ware jug from K93/98, a Black-on-Red Ware jug from K93/125, and the White Painted III or IV Ware fragment from K94/1 mentioned before). They originate in Archaic layers in the northern part of the Rue Ibn Chabâat excavations, in and around room T1 (see Vegas 1999a, 98, fig. 4). I thank M. Vegas for informing me on these finds.
- <sup>36</sup> The ARCHBANK database of the Hamburg excavations lists only the individual diagnostic fragments. The total number of sherds recuperated and processed during the excavation is many times as numerous.
- <sup>37</sup> Plain Ware: BM00/16412 from context BM00/8052; BM00/15746 from context BM00/8030; BM00/15951 and BM00/15954 from context BM00/8031. Handmade Ware: BM00/17319, from context BM00/8099; BM00/16901 from context BM00/8063; BM00/16647 from context BM00/8052; BM00/16427 from context BM00/8020; see Docter forthcoming c. Esp. the two latter ones are comparable, since they are provided with a knob.
- <sup>38</sup> According to the stratigraphical data yielded by the excavations below the nearby *Decumanus Maximus*, local Plain Ware pottery with smoothened surfaces disappears as late as the last quarter of the 5<sup>th</sup> century BC.
- <sup>39</sup> Besides Cat. 16-18, 23-24, 3 more painted wall fragments in the local fabric from this context remained un-inventoried. According to the stratigraphical data yielded by the excavations below the nearby *Decumanus Maximus*, local Painted Ware is particularly characteristic for levels of the 4<sup>th</sup> century BC.
- <sup>40</sup> This contribution presents research results of the Inter-university Poles of Attraction Programme - Belgian State, Prime Minister's Office - Federal Office for Scientific, Technical and Cultural Affairs.
- <sup>41</sup> Identifications of molluscs are based on comparison with the reference collection of the Royal Museum of Central Africa and with the figures in Poppe/Goto 1991.
- <sup>42</sup> Dates on fusion of long bones and on tooth eruption have been taken from the compilation of Schmid 1972.
- <sup>43</sup> The faunal remains from the excavations of the University of Amsterdam (2000 and 2001) are currently being prepared for publication by J. Slopsma and L. van Wijngaarden-Bakker.
- <sup>44</sup> My thanks go to the following persons for their help in analysing the metal objects and metallurgical finds from the Carthage excavations: R.F. Docter (chair of Greek archaeology, Ghent University), H. Schenk (chair of crystallography, University of Amsterdam), R.J. Jansen (Röntgen Department of the Academic Medical Centre, University of Amsterdam), P.H. Hallebeek (Department Anorganic Chemistry of the Foundation 'Collectie Nederland', Amsterdam), W. Dohle (Department of Zoology University Zoological Medical Science, Utrecht), P.S. Strankinga (Department of Internal Medicine at the 'Boven het IJ' hospital, Amsterdam). Special thanks go to the Institut National du Patrimoine (Tunis) and the directors of the National Museum of Carthage, A. Ennabli and his successor F. Chelbi, for allowing the temporary export of some of the metallurgical residues and bellows' pipes for further analyses in the Netherlands. This has greatly advanced the study of this material.
- <sup>45</sup> Presently, F. Essaadi is preparing a monography on the metallurgy of Carthage. In this study also the bellows' pipes from the German Rue Ibn Chabâat excavations will be included (see now, Rakob 2002, 46, pl. 11,4). For preliminary reports, see Essaadi 1995a and Essaadi 1995b.
- <sup>46</sup> The oldest pottery was fired in this oxidising way. If the clay contained, as is usual, a high percentage of iron, the colour of the finished product will be red. Only few of the iron-containing clays will yield pots with a white surface and a dark or grey core. This is caused by the transformation of organic material in carbon.
- <sup>47</sup> H.H. Coghlan in 1939 (see Coghlan 1939-1940) did the first experiments, which confirmed this procedure, making use of malachite as ore.
- <sup>48</sup> Within a strategically positioned furnace on the south slope of a hill, the heat of the sun will make the air rise and, thus, cause a sufficient natural draught. This type of furnace is still in use in parts of Africa and Burma: Wertime 1961, 138; Bielenin 1977, 11-26.
- <sup>49</sup> The melting points of some of the most commonly known metals are: 1063°C (gold), 961°C (silver), 1083°C (copper), 1535°C (iron), and 1150 - 1210°C (the matrix of iron ore).
- <sup>50</sup> For a full overview of the development of the fan and the bellows' pipe, see Forbes 1950, 113-123.

- <sup>51</sup> P.S. Strankinga, personal remark.
  - <sup>52</sup> The literature known to me does pay attention to the development of the bellow, but no information is available on its first use.
  - <sup>53</sup> Foy 1909, 185-192; Klosemann 1924, 120-140.
  - <sup>54</sup> Tylecote 1987, 124. These unused bellows' pipes are so richly decorated, because of their function as gravegifts, probably of a bronze founder.
  - <sup>55</sup> Bellows' pipes are hardly ever included in excavation reports, not even in the publication of those sites where metalworking is known to have taken place on a large scale. The knowledge to distinguish between a bellows' pipes and pottery fragments is in my opinion still insufficiently developed among archaeologists.
  - <sup>56</sup> The calculation is based on the data of Wynne 1958, 339-348, which I have converted to a furnace with an internal diameter of 30cm. This furnace diameter is based on the so-called Baratti-furnace, which is the best-reconstructed furnace of the 6<sup>th</sup> century BC, known to this moment. Older furnace types had considerably smaller diameters, but their reconstruction remains very hypothetical, due to the lack of sufficient archaeological indications. On the reconstruction of the Baratti-furnace, see Voss 1988 and on older furnace types Cleere 1972.
  - <sup>57</sup> W. Dohle, personal remark.
  - <sup>58</sup> For an experimental test, we used a traditional rubber water bag with a content of 10 litres. Its opening was reduced to 15mm and, in order to imitate the air resistance within the furnace, we attached its end to a sand-filled basin. The 'bellow' could without any difficulty be moved up and down 8 to 10 times per minute.
  - <sup>59</sup> See e.g. Niemeyer 1983 with references for different sites.
  - <sup>60</sup> The publications are unanimous in stating that this is the ideal grain size, but the argumentation is lacking. More research has to be done in this respect.
  - <sup>61</sup> Before any conservation measures are taken, the metal finds are scanned at the Röntgen Department of the Academic Medical Centre of the University of Amsterdam.
  - <sup>62</sup> For bronze needles of the Late Bronze Age, see White 1987, 113, fig. 22 (8871-M-8) and of the Classical Period, Robinson 1942, 362, 1750-1752, pl. 115. See also Rostoker, Gebhard 1980.
  - <sup>63</sup> The study of the metal finds from the 2002 Bir Massouda campaign is not an isolated effort. In combination with the metal finds from the University of Hamburg excavations below the *Decumanus Maximus*, in the northern part of the Bir Massouda site (see H. Koens, K. Mansel in Niemeyer *et alii* forthcoming), and the finds from the excavations of the University of Amsterdam on the site of the years 2000 and 2001 (in preparation), the present finds may furnish more information.
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# The Potenza Valley Survey: Preliminary Report on Field Campaign 2002

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## Abstract

*This contribution presents the third report about the on-going survey project of Ghent University in the Adriatic valley of the River Potenza (Marches, Italy). The project investigates the settlement history of the valley, essentially between 1000 BC and AD 1000. In 2002 substantial results in the whole valley have been obtained with the help of remote sensing techniques, while the field surveys and study of surface finds have focussed on the protohistoric and Roman occupation of the coastal area. The article comprises also an introduction to geo-archaeological investigations and the use of an original GIS and presents some results concerning Stone Age finds.*

## INTRODUCTION

Since 2000 the Department of Archaeology at Ghent University conducts a survey project in the Central Italian region of Marches, titled *The Potenza Valley Survey*.<sup>1</sup> Thanks to the acquisition of additional financial support<sup>2</sup> in 2002 we are able to prolong this research program at least until 2006. The aims and methods of this long term-project, as well as the results of the first two field campaigns in 2000 and 2001, have been published in *BABesch*.<sup>3</sup>

The project's survey-area remains constricted to the circa 80 km long valley of the river Potenza in Adriatic Central-Italy (Marche). Within this broad area three test-zones for more intense fieldwork are chosen, situated in the upper Potenza valley (near Camerino), in the middle valley (near Treia) and in the lower valley (near Porto Recanati) (*fig. 1*).

As the new financial support had been obtained within the framework of an international research program, which focuses on Late Antiquity (3<sup>rd</sup>-7<sup>th</sup> centuries),<sup>4</sup> very special attention is now paid to this particular period. Nevertheless the original aim to measure long-term evolutions and changes between 1000 BC and AD 1000 will generally be sustained. As has been emphasized elsewhere, it is precisely such a long-term view, which allows placing the developments of ancient society in a sufficiently broad perspective. Still, other periods are not ignored, and it is intended that the analysis of the survey results will range across the whole period of human settlement.

In this report we will present some preliminary results of a substantial part of the aerial photography and the archaeological fieldwork of 2002, a first evaluation of the study of the surface finds of 2002 and a preliminary introduction into geo-archaeological work in this coastal area during 2002. The report also includes an introduction into the elaboration of GIS applications in the project and a first report on the study of Stone Age material recovered in the whole Potenza valley.

## AERIAL PHOTOGRAPHY IN THE POTENZA VALLEY IN 2002

*Frank Vermeulen & Jacques Semey*

In earlier reports and publications<sup>5</sup> we have particularly stressed that active aerial photography from a low flying aircraft is one of the main detection techniques being applied in the Potenza Valley Survey. As the Ghent team has extensive experience with this kind of remote sensing and its GIS applications, and conditions for aerial photography are very favourable in the central Marche area,<sup>6</sup> a program of intensive flying and oblique aerial photography has been developed since 2000, with yearly campaigns of systematic detection between the months of April and September. The methodology applied here has been explained elsewhere.<sup>7</sup>

In 2002 we considerably increased the number of flights, in total some 20 hours of flying, particularly during the months of April, May and June.<sup>8</sup> In this way our Potenza collection of oblique aerial images was extended to a total of more than 4000. This resulted not so much in a spectacular

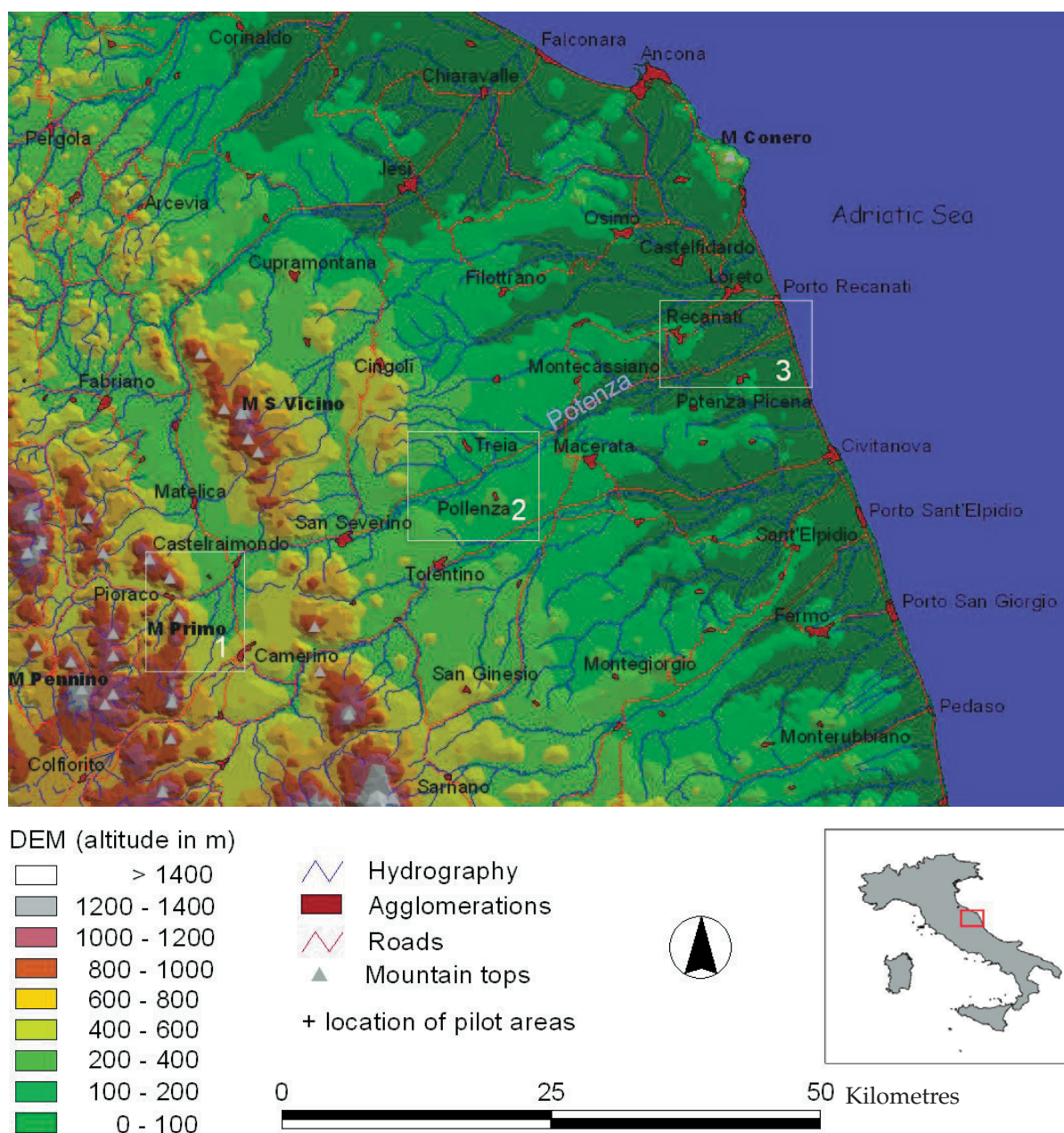


Fig. 1. Topography of the Potenza river basin and surroundings, with indication of the 3 sample zones (illustration by Tanja Goethals).

increase of the number of new possible archaeological sites and ancient field structures (such as fragments of roads, ditches, pits, ...), but more in a follow up of known sites of which much new information could now be gathered. As in earlier years this follow up also concerned the many new sites that had been found during our field-walking campaigns and whose location, extent

and appearance could now be investigated from another 'point of view'.

The results of this year's work are again very diverse. For reasons of brevity we will discuss here only the three types of discoveries which yielded the best information: geo-traces, proto-historic settlements and a variety of Roman structures and sites.





*Fig. 2. Crop marks of a small (circa 30x20 m) villa discovered during a June flight in the Upper Potenza valley in Pioraco (photo F. Vermeulen).*

To the already wide range of traces belonging to the geomorphology of the ancient landscape of the Potenza valley (terraces, traces of erosion, ...) we now added a great number of paleofluvial gullies, which were distinguished as crop marks or soil marks in the arable land of the Potenza plain. Especially in the coastal area a whole series of such traces were added to those already noted. They will be of great help in the pursuit of a reconstruction of the ancient river courses near the Adriatic coast, which will be combined with the data of the corings (see below) and of the distribution of archaeological sites in the area.

The often more difficult to trace settlements of Bronze and Iron age in the valley, which form only a small group among the sites discovered through fieldwalking, were now a bit better revealed during our 2002 flights. Especially in the upper valley, near Camerino, we could plot some clear crop marks of pits and ditches seemingly associated with the small protohistoric sites that were located here by way of line walking. Such traces were e.g. distinguished at a probably early Iron Age site near Mergnano San Pietro, discovered in 2000.<sup>9</sup> The larger and more centralised protohistoric sites of the Monte Franco in the

middle valley and Montarice in the lower valley were also regularly over flown. Crop marks and especially soil marks procure us here clear indications of the extent of the settled zone and, especially in the case of Montarice, of differences in erosion of the archaeological layers and the possible presence of a circuit wall or earthwork.<sup>10</sup> Their compatibility with the field survey results is striking, an assessment which will be closer examined within a GIS environment in the near future.

Again the Roman period is best documented in our aerial database. A majority of the now almost 100 new survey sites of that era discovered in the three sample zones and in some other parts of the valley are also visible from the air. In most cases amorphous soil marks photographed at the end of September coincide well with concentrations of settlement debris and ploughed up occupation layers on the surface.<sup>11</sup> In only very few instances, however, crop marks have also revealed linear features belonging to the walls of buildings. Great was our surprise, during a June flight over the upper valley survey zone in Pioraco, that one of the smaller line walking sites indicating a Roman settlement suddenly revealed a very clear series





Fig. 3. Crop marks of Roman buildings and street in the urban center of the municipium Trea, discovered in May 2002 (photo F. Vermeulen).

of linear crop marks forming the complete plan of a small villa-like structure. On fig. 2 we remark a compact rectangular building with a very symmetrical layout and several rooms centered on a central courtyard. On its southern side it could also have a portico overlooking the nearby river Potenza, situated only some 50 m south of the building. This discovery is important as it procures us not only an excellent proof of the reliability of the fieldwalking results, but gives us also the first complete (?) plan of a Roman rural settlement in the central Marche region. The surface finds indicate here an Early Imperial date but a re-survey will be needed to refine the chronology.

The most spectacular results of the flying season concern, however, the Roman town sites in the valley. Four Roman cities are located in or near the Potenza plain<sup>12</sup> and all of them were abandoned and not built over in medieval times. As the former urban areas are now mostly covered by arable land, we still have the opportunity to use survey techniques, such as remote sensing, on their surface and this approach was much in focus during the 2002 campaign of flying. The middle valley towns of *Septempeda* and *Ricina*

revealed only a limited number of traces. Some of them seem to be connected with the town walls and suburban living quarters or cemeteries, but they are still difficult to interpret.

Our observations in the middle valley town of *Trea*, especially during a late April flight over the growing grain fields, were most satisfactory. The urban topography of the municipium of *Trea*, probably founded during the first half of the 1<sup>st</sup> century BC, is still ill-studied. Notwithstanding the start of archaeological research on the site during the late 18<sup>th</sup> century and a reactivation of scientific study since the 80's of the last century, only limited excavations have been done here. Thus far only very restricted information about the possible urban grid was assembled, indicating parts of a couple of Roman buildings and presenting a hypothesis for two street directions.<sup>13</sup> During our April flight, succeeded by a series of follow ups in the course of later months, we could reveal the major elements of the central part of the Roman town (fig. 3). Situated on a pronounced plateau this central part disclosed in remarkably clear crop marks the presence of: a partly bended *decumanus maximus* of the town, a whole network

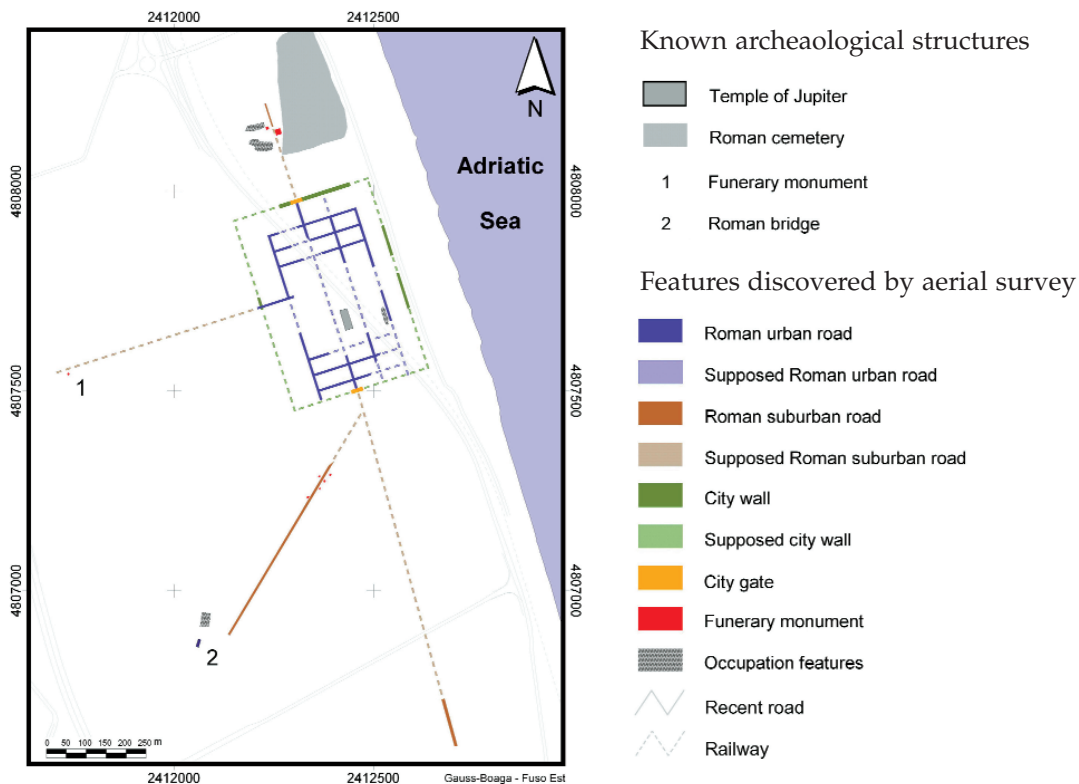


Fig. 4. The topography of Roman Potentia and its suburban area, combining old discoveries, new aerial photography data and additional information from systematic fieldwalking (map G. Verhoeven).

of streets parallel with or at right angles to this east-west oriented main street, the location of the forum with portico and surrounding monumental buildings and a series of other buildings (shops, houses) dispersed within this city grid. Although the urbanisation seems to be laid out in a disorderly fashion, we suspect, as is often the case in 1<sup>st</sup> century BC new cities, that some modulated system was applied here. The mapping process of these oblique photographed structures, a difficult exercise here because of the hilly topography of the site, will no doubt explain the organisation behind the city layout. During the 2003 campaign we will have to supplement this aerial information with precision measurements in the field.

The flights over the fourth city, *Potentia*, lying at the mouth of the river, were also accelerated. Again some new elements of the urban extent, street pattern, defensive architecture and the suburban context of this colonial town, founded in 184 BC, were now mapped. We started to combine these new aerial views of crop and soil marks with other remotely sensed data, such as available vertical photographs and manipulated satellite data. Within a GIS environment they were also

confronted with the new information available from our field approaches, namely the archaeological fieldwalking and a first geomorphologic survey of the area (see further).<sup>14</sup> As our data are much more detailed we think that the plan of the urban centre and especially the suburban areas around Potentia is now much more detailed and in a sense more reliable than what was known previously (fig. 4). We refer first to the layout of the circuit wall of this rectangular city, the details of the inner street network and the emplacement of at least two gates (north and south). Although still no other buildings inside the town can be differentiated, we isolated some individual traces such as pits and possibly gullies. Most innovating are our discoveries by way of aerial photographs of extra-mural Roman infrastructure, such as at least three roads leaving town, two zones with funerary monuments along these roads and several discolorations indicating suburban living quarters. The details of this new vision on *Potentia* will be presented in a later publication, when more chronological data of the pottery survey and possibly the results of geophysical work during the 2003 campaign are available.<sup>15</sup>

*The Holocene evolution of the coastal plain*

In the coastal plain of the Potenza the Holocene changes are due to an interaction of both anthropogenic changes and natural sea level changes. In the early Holocene, as a response to the Flandrian transgression, the coastline retrograded to about 4 or 5 km inland of the present coastline. The coast of Marche region was at that time an alternation of rocky promontories and pocket beaches (fig. 5). The shoreline did not move substantially until at least 4,000 years ago, in spite of the sediments that were transported to the sea by the meandering streams. Indeed the maximum sea level was reached in the period between 7,000 and 4,000 years ago according to Calderoni *et al.* (1996).

The coastline started to move seawards 4,000 years ago. In the 3<sup>rd</sup> century BC the coastline was rectilinear, with sandy-gravelly beach ridges in a direct line with the cliffs, and with coastal lagoons and swamps behind those beach ridges (Ortolani/Alfieri 1979). The reason for this infilling with sediments, according to Coltorti (1997), was the first systematic land reclamation and following soil erosion in the middle courses of the river during the Bronze and Iron Ages. According to Butzer (1982) slash-and-burn was gradually replaced by sedentary agriculture. The transported fine sediments were trapped at the river mouth by the beach ridges and settled in the lagoons. Stagnating waters in the swamps engendered malaria.

Roman roads were constructed on the beach of the internal lagoons, because the beaches of the bays themselves were not stable and could be pierced during storm tides. Roman ports such as Cupra Marittima, Torre di Palma and Martinsicuro (Truentum) were constructed at the base of the cliffs, in areas not influenced by river dynamics (Alfieri 1983). At that time the coastal plain was covered with thick forests, which were cut down from the 15<sup>th</sup> century onwards for land reclamation (Baldetti *et al.* 1983). Most sedimentation took place during the Roman Age and the early Middle Ages, diminishing afterwards due to anti-erosion measures and the decline of the population and natural reforestation after the 'barbaric invasions'. This sedimentation filled the lagoons and swamps, turning them gradually into dry land.

From the 16<sup>th</sup> century to the end of the 19<sup>th</sup> cen-

tury, the coastline again moved seawards at a fast pace, because of the deforestation for land reclamation of the entire periadriatic zone. The total distance travelled by the coastline amounts in some places of the Marche region to more than 500m (Coltorti 1997). The result was that almost all cliffs became inactive, at their base beaches appear, with urban centres, such as the town of Porto Recanati at the mouth of the Potenza. The initial core of this town now lies 150m inland (Coltorti 1997). The only active cliffs are present along the Monte Conero massif and in the north of the Marche region. Many coastal swamps, amongst them the ones of the Potenza river, are filled up with sediments; forests are cut down; and many rivers are diverted and/or straightened. The anti-erosion measures and reforestation of the slopes with the 'alberata' system stopped the progression of the coastline in the 20<sup>th</sup> century. The trend even inverted, so that the coastline now has to be protected against erosion.

*A specific geo-archaeological approach in pilot area 3: river movements*

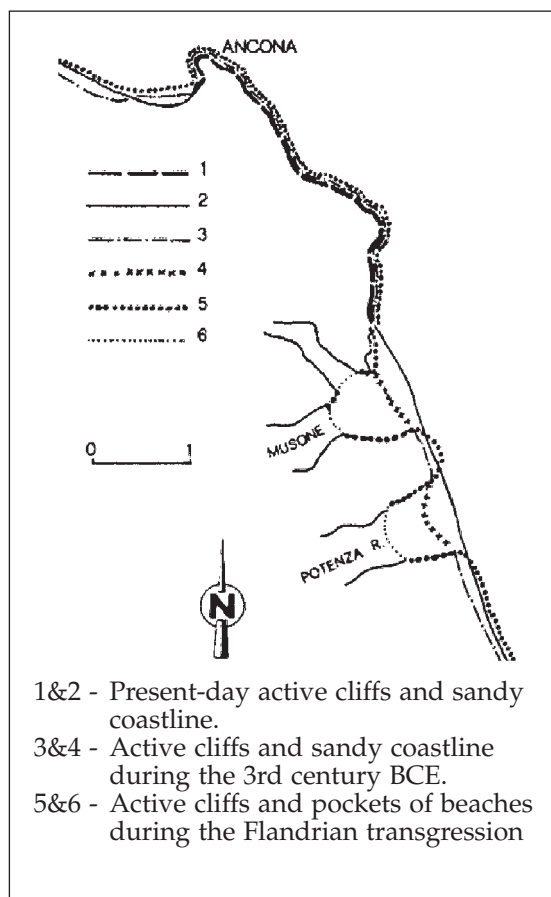
Pilot area 3 (fig. 6) is focused on the coastal plain of the river Potenza. Deposition predominates here on a regional and long-term scale. As a consequence river terraces are mostly buried under the nearly flat coastal plain. Some remains of older marine terraces may be present. In the case of the Potenza, the coastal plain near the mouth is about 3 km wide, while the distance between the interfluvies is only about 7 km wide. Near the coast old beach ridges, parallel to the coast, are buried beneath clayey flood-sediments. In between these old beach ridges and the present ones, the homogenous loamy clay to clayey loam sediments point to the earlier presence of a coastal lagoon.

Three sites are fundamentally important in this pilot area: the protohistoric site of Montarice, the Roman town of *Potentia*, abandoned in late classical-early medieval times, and the medieval town Potenza Picena, probably founded by the former inhabitants of *Potentia*.

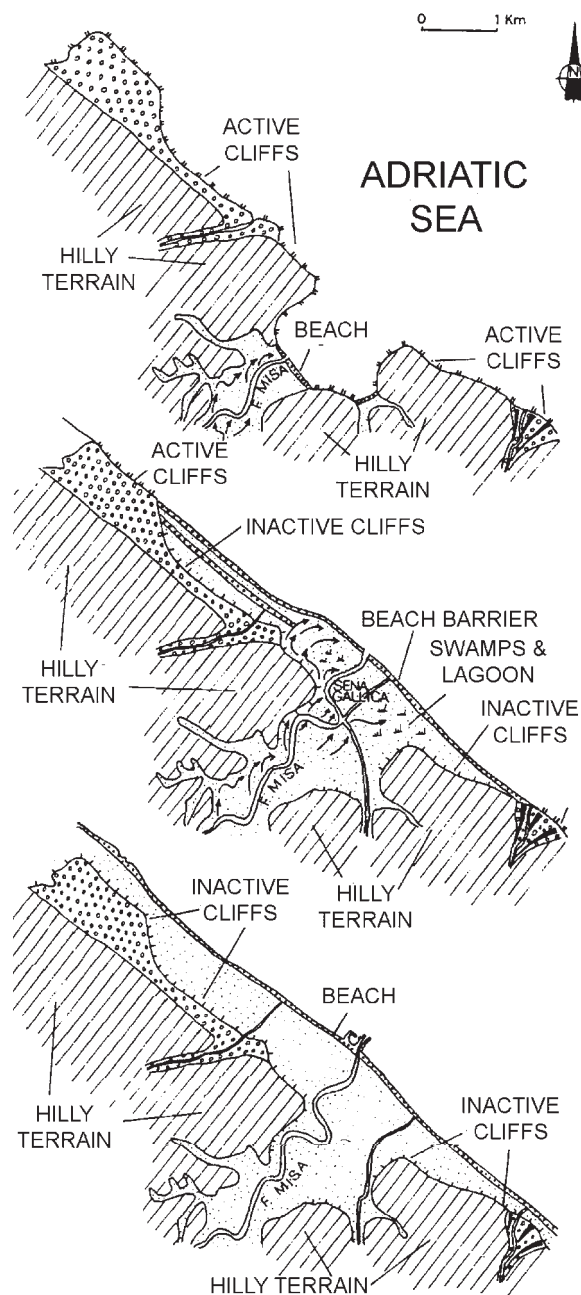
1 The Montarice site, founded in the Bronze Age but important to the Iron Age Piceni culture as well (see further), was only recently ploughed up and discovered at the end of the interfluvie between the river Potenza and the river Musone to its north. The site is probably a kind of *oppidum*, a pre-urban circumvallated site. It is situated on a nearly flat surface of about 4.2 hectares large, covered with a fluvial gravel bed and marine clays, and with steep slopes

bordering the entire plateau except on the NE-side. The steep slope at the SW-side is probably due to the recent construction of the motorway Bologna-Pescara, but the others seem natural. Consequently, the defence of the site could be secured by the raising of only two walls, on the afore-mentioned NE- and SW-sides; the other slopes, covered with slope-waste material and probably overgrown with a spiny bush-vegetation, provided natural defence. Moreover, the site enjoys ample view on the coastal plain of the Potenza.

- 2 The Roman town of *Potentia* was founded in 184 BC at the coast, but is now situated about



- Beach and barrier beach
- Alluvial plain
- Swamps and coastal lagoons



- Pleistocene marine terraces
- Upper Pleistocene alluvial fans
- Hilly terrain

Fig. 5. Holocene evolution of the coastal plains in the Marche region. The inset exhibits the position of the coastline during the main Holocene phases; the main figure illustrates the geomorphological effects of Holocene changes in the coastal plain of the river Misa, analogous to the river Potenza (after Coltorti 1997).



Kilometres 

*Fig. 6. Topography and situation of pilot area 3.  
The indication of archaeological sites discovered by way of field survey is preliminary (map T. Goethals).*

400m inland, proving again the progression of the coastline since Roman times. It seems that it was located almost completely on a large beach ridge.

- 3 Potenza Picena is situated on an isolated hilltop, a typical position for the medieval 'incastellamento' movement, when protection against attackers was the main concern.

The river Potenza nowadays flows at the foot of the northern interfluvium and the Montarice site, displaced to the very north of the coastal plain. However, the river has been displaced in historical times. Indeed, a Roman bridge remained in the coastal plain of the Potenza, at the locality 'Casa dell'Arco', 1.5 km south of the actual bed.

The research hypotheses stated that the Potenza in protohistory would have been roughly in the same position as nowadays, would then have been displaced to the south to flow under the Roman bridge, and would only recently have been diverted again, possibly with the purpose of reclaiming coastal land (*fig. 7*).

The protohistoric hypothesis is based upon the fluvial terrace, one of the few terraces in situ, and the morphology of the SE-slope of the Montarice plateau: the gradient of this slope is 33°, which is about the maximum gradient that can be established by natural causes in loose sediments. This

feature leads to think that this slope has probably been the undercut bank on the outside of a Potenza meander bend for some time before the Roman Age. This would have provided the protohistoric site with extra protection and water supply.

The Roman hypothesis leans basically on the presence of the Roman bridge at Casa dell'Arco. An augering beneath this bridge indeed revealed a fluvial type profile. Radiocarbon dating of the sediments pointed out that the Potenza would have flowed under this Roman bridge until the late Middle Ages. Another argument is the position of the two now buried beach ridges investigated by augerings: they have an opening more southwards than the present river mouth. That these beach ridges already existed during Roman Ages is proved by the fact that the Roman town of *Potentia* is built on top of the northern beach ridge, and that the wall of a Roman pottery furnace found in 2002 by the Ghent survey team is built on a more southern beach ridge (the base material for this ceramics production was of course the lagunar clay). These beach ridges have also been subject to floods during Roman Ages and later, as a clay layer was deposited on top.

In the late Middle Ages and early Renaissance, large tracts of land in the Marchean coastal plains were reclaimed (Cencini/Varani 1991; Nanni/

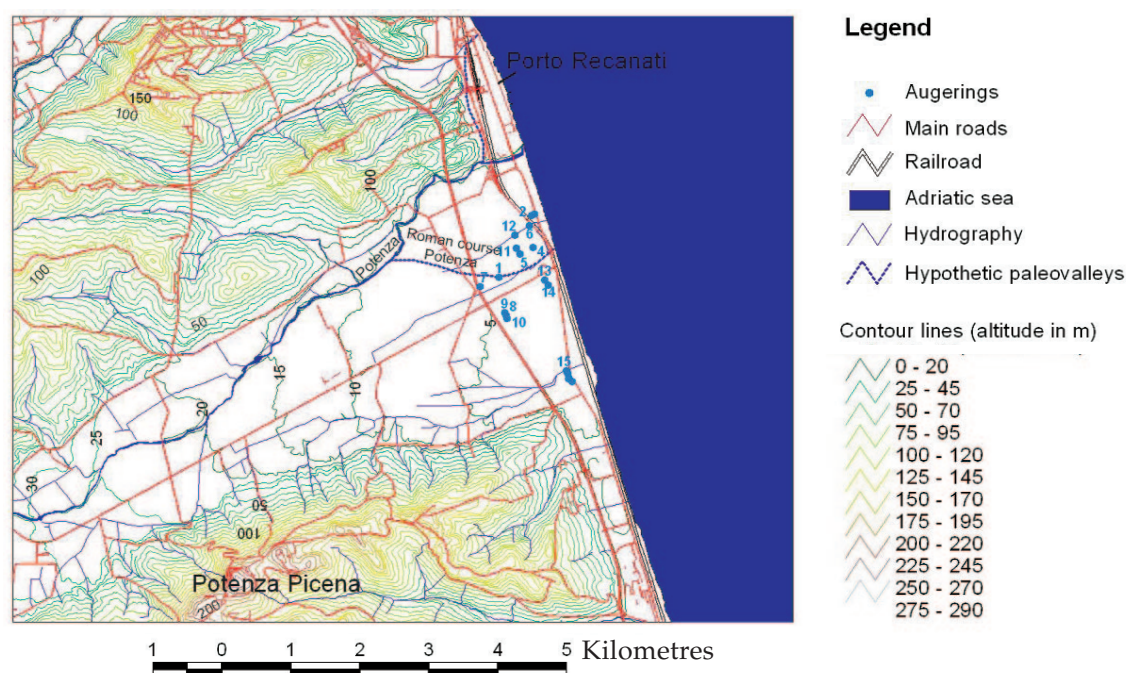


Fig. 7. Topography of the Potenza river mouth and hypothesized paleocourses of the Potenza, with indications of augerings made in 2002 (map T. Goethals).

Vivalda 1987). This probably applies to the Potenza as well. Buli & Ortolani (1947) mention the consent of Pope Gregorius IX (1170-1241) given to the inhabitants of Porto Recanati to make the Potenza, Musone and Aspicio rivers debouch together. At the new mouth, a new harbour would be built. The project was abandoned in 1474, but it is likely that already some diversion of the Potenza was caused by this human intervention.

From the previous remarks it is obvious that many arguments support the hypothesis. However, a detailed mapping of the coastal plain by means of augering and geo-electrical measurements should further clarify the mechanisms and processes. It is clear that further new information on the coastal evolution and diversions of the river Potenza are very important to understand long range settlement dynamics in the area.

THE SEPTEMBER 2002 ARCHAEOLOGICAL FIELD SURVEY  
IN THE COASTAL AREA OF THE POTENZA VALLEY

Frank Vermeulen & Catharina Boullart

The area investigated during the 2002 campaign is situated in the lower valley of the Potenza, near its mouth. The transect of some 25 km<sup>2</sup>, to be field-walked over two summer campaigns,<sup>16</sup> is bordered by the medieval rooted hilltop towns of Potenza

Picena and Recanati. It includes the strategic proto-historic hilltop site of Montarice and the Roman colony *Potentia* lying near the original river mouth. The location of both central sites in this area, as well as the immediate contact with the all important coastline are the main reasons for choosing this study area as third intensive sample zone. The general landscape features of this coastal zone are described above.<sup>17</sup>

The methodology of fieldwork in this third sample zone was similar as in the two other survey areas, situated respectively in the upper and middle valleys of the river Potenza.<sup>18</sup> This year however we could make use of excellent, recently published (2000) maps of the Regione delle Marche on a 1/10,000 scale. As these are also available in a digital format this was very helpful for the introduction of the data in the GIS.

As much effort went into the intensive intra-site surveys of *Potentia* and Montarice (see further), the total surface covered by our line-walking was limited this year to a mere 2.57 km<sup>2</sup> (257 ha). This relatively small area is foremost situated on the southern foot slopes of the valley and in the area of the river plain closest to the coastline. Both central sites excluded, we could however define some 30 new and formerly unknown sites, mostly on the basis of comparatively higher sur-

face artefact density or by the presence of certain surface anomalies. All potential chronologically diagnostic artefacts, all feature sherds (rims, bases, handles), all prehistoric pottery, and all lithic artefacts encountered were collected during the routine field survey and treated as a group according to field number. The still preliminary processing of all archaeological material<sup>19</sup> and a first apprehension of the main topographical aspects of the sites and of some of the off-site finds, leads to a series of limited observations. As the prehistoric and medieval periods are still very under-represented we will not yet discuss them here.

*The coastal plain in protohistoric times and intra-site prospection at Montarice*

No major sites older than the Roman Age were found in the coastal plain itself. A few small groupings of protohistoric pottery found there must still be evaluated before any firm conclusions are possible. It is probable that such sites are now buried too deep to be found by superficial prospection, but further geomorphologic corings in the plain are needed.

The eastern extension of the hilly ridge bordering the plain to its south, the Monte dei Priori, yielded some protohistoric finds. It concerns at least two small concentrations of protohistoric pottery, some bones and charcoal, found in a greyish layer of organic soil. This material is ploughed up and seems to indicate *in situ* structures. The finds suggest the presence of settlement structures on the upper north-east oriented slope of the Monte dei Priori. The location is interesting as it procures a fine view over the plain and the coastline, but the chronology of the *impasto* pottery found here is still problematic. The site could well be a topographic counterpart of the site of Montarice.

On the left bank, near the Potenza River mouth the aerial surveys of our team in 2000 and subsequent preliminary fieldwalking identified a major protohistoric site at Montarice, on a promontory north of the actual river mouth. In a field of sunflowers were revealed different linear traces (fig. 8), some of which probably belong to the ancient enclosure of this imposing protohistoric site. A short field check of the general topography and of some of the internal traces and spots indicates that this site with known Bronze Age occupation<sup>20</sup> and the recording of 'sporadic Iron Age material' by Lollini in 1976,<sup>21</sup> was no doubt also very important in the Iron Age.<sup>22</sup> This circa 4.2 ha large pre-urban structure had possibly a role to play in

the control of the river mouth and of the Adriatic shore by a local Piceni-elite. The resemblance with the situation at Montedoro di Scapezzano,<sup>23</sup> near the river Cesano, is striking. Both sites fit in the reiterate cohesion between old river mouths and neighbouring protohistoric altitude settlements which is observed along the Middle-Adriatic coastline and can be connected with the maritime commercial routes of the Greek merchants.<sup>24</sup> In the case of Montarice a direct connection can be sought for with the Greek coastal settlement at Numana, located only 14 km northwards.

During the September 2002 campaign in this area we investigated the plateau-site of Montarice more in detail and the presence in the ploughed field of great numbers of protohistoric coarse ware, Piceni-bucchero wares and even Greek wares was clearly confirmed. Near the north-eastern and south-eastern corners of the plateau we observed zones with large pebbles, which might represent ploughed up remains of a circumvallation. The ceramic material, but also bones and building material (including wattle and daub), was collected in a very systematic way in view of intra-site dispersion analysis and is now being processed. We can however already discuss some preliminary results here.

Although ceramic and other material was present all over the plateau, denser concentration zones are marked on fig. 9. These zones, with the high number of 300 to 600 sherds per 30x30 square (picked up by 3-4 persons in maximum 30 minutes time), are mostly situated at the northern and southern edge of the hilltop. The very summit of the hill seems to have suffered much from ploughing activity, which could explain the decrease in artefacts towards the centre of the plateau.

Bearing in mind the sheer quantity of early finds we suspect that the Montarice plateau has only recently been subjected to deep ploughing and levelling, within the context of its modern agricultural use.<sup>25</sup> This could explain why the edges still hold a very significant number of artefacts, exceeding by far a normal surface distribution for protohistoric finds.<sup>26</sup> In this respect the picture at Montarice seems at first sight different from Montedoro, where atmospheric influences, but most of all an intense agricultural activity, wiped out almost all traces.<sup>27</sup> In ancient times the hilltop sides were probably much more articulated, a situation still visible at Montarice where an earthwork remains in the eastern half of the hillside edges. A detailed confrontation of the aerial photographs, intra-site survey results, pottery identifications and planned geomorphologic





observations and topographical measurements will no doubt shed more light on the organisation and evolution of human occupation at this site.

At the southern edge of this plateau remnants of an old entrance road are still visible. On the old IGM map (Loreto 118), designed in 1892 and adjusted in 1948, a road is drawn leading from the more inland Burchio hill to Montarice. Both clearly individualized hilltops have later been further separated by the construction of the Adriatic motorway. It is however not to be excluded that this road can go back to pre-medieval and even pre-Roman times.

Besides the general abundance of Bronze and Iron Age pottery on the plateau itself,<sup>28</sup> other interesting surface scatters were observed. Below the steep edge on the slope facing the actual Potenza River south of the Montarice hill, a dark greyish zone of earth mixed with many artefacts could easily be distinguished. Most pottery found here, including many imports, seems to belong to the Iron Age. Two interpretations are possible: we may deal with a normal outflow of soil material from the plateau in a gully colluvium, but it could also be an isolated unit located on a former terrace on the south slope with particularly rich pottery contexts.

*Fig. 8. The protohistoric site of Montarice from the air: crop marks and soil marks (photos J. Semey & F. Vermeulen).*





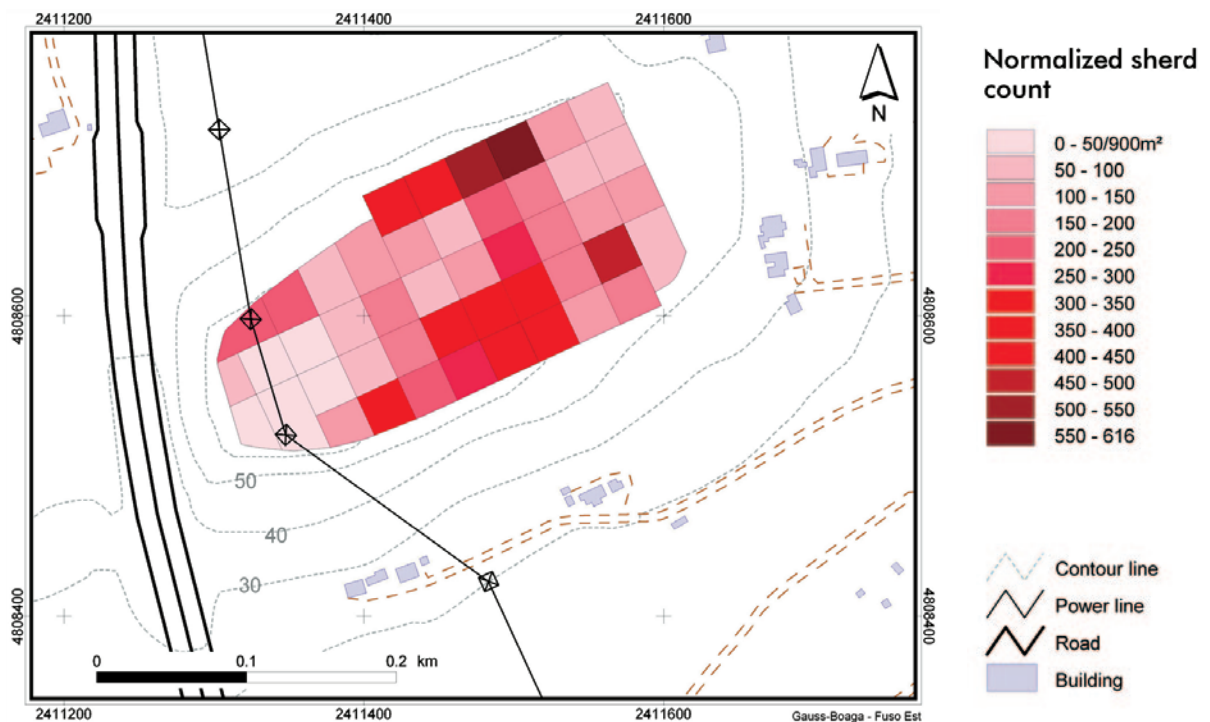


Fig. 9. Sherd density plan of the September 2002 fieldwalking on the site of Montarice (map G. Verhoeven).

#### *Intra-site prospection of *Potentia* and the hinterland of a Roman coastal town*

The Roman colony of *Potentia* was founded in 184 BC.<sup>29</sup> It is located on a beach ridge near the mouth of the river Potenza south of actual Porto Recanati. Since its first identification by Alfieri<sup>30</sup> important scientific work has been done on the site: large scale rescue-excavations on one of its cemeteries,<sup>31</sup> excavations on the north-eastern corner of *Potentia*,<sup>32</sup> a study of some important aerial photographic indications of its regular street grid,<sup>33</sup> a bibliographical synthesis and analysis of monuments and inscriptions<sup>34</sup> and since the mid-eighties systematic excavations in its monumental centre. The Soprintendenza Archeologica delle Marche discovered here a Republican temple for Jupiter, surrounded by a portico and other buildings of Republican and Imperial age.<sup>35</sup>

The excavations in the city centre confirm the regular layout of the late Republican town and only slight changes during early Imperial times. They also show a great vitality of the town during the 2<sup>nd</sup> century AD, followed by a 3<sup>rd</sup> century crisis (less finds, less graves), which could partly be caused by an ecological decline and the formation of marches in the formerly well-organized and centuriated agrarian valley-bottom near the Potenza-mouth.

During the economic revival of the late 3<sup>rd</sup> and 4<sup>th</sup> century AD the central town area was reorganized. The coin series suggests a positive atmosphere until the beginning of the 5<sup>th</sup> century, followed by a clear decline. The youngest archaeological finds are dated in the 7<sup>th</sup> century AD.

As the ongoing digs in *Potentia* affect only its monumental centre, archaeological evaluation of changing size and density of the urban settlement can only be approached by way of survey-techniques. Since we are fortunate that the town site is devoid of too many modern disturbances - only a coastal road and railway and a couple of houses cover it - we can be confident that in the course of this project much information about its topography and evolution will become available. For this, several techniques of research are being developed, such as systematic aerial photography (see above), GIS-analysis of other remotely sensed data and soon also geophysical prospection. One of the most reliable ways to study the city's extent, however, is through the use of intensive surveys based upon line walking and through the study of surface material. This approach will allow us in *Potentia* not only to establish the changing boundaries of the urban occupation, but also to identify the character of some quarters and to evaluate the changing density patterns.



Fig. 10. Roman sherd density plan of the September 2002 fieldwalking on the Potentia site and its suburban area (map G. Verhoeven).

Part of this summer's terrain work was focused on an intense general city survey. The whole urban area of the ancient town, currently under ploughing, was subdivided in regular units (on average 40x40 m) and large samples of datable ceramics and other artefacts were collected in a systematic way. As on Montarice, every square of the grid was walked by 3-4 persons in maximum 30 minutes time. A protected (not-ploughed) part of the site, as well as the areas with modern disturbances, could not be investigated in this way.

The first available distribution maps, showing sherd density in and around the presumed habitation centre (fig. 10), already reveal the differences in occupation density in several sectors of town. Their chronological and functional significance should now be further analysed. Several tracts of the street pattern, known from our aerial photographs, were well identified on the ground, mostly as clear concentrations of river pebbles. The survey results were also indicative for the precise localisation of a north and a south gate in the circuit wall, most likely built with blocks of limestone, and of small parts of the northern circumvallation.

Further study of the collected materials is awaited before conclusions about the Republican to Late Antique evolutions of the city can be

made. This intensive field survey of *Potentia* is carried out in close collaboration with a geomorphologic team in order to take into account biases induced by physical processes at the site, such as erosion and riverside sedimentation. The latter are predominantly present on the southern and eastern sides of town. Geo-archaeological mapping and analysis by Morgan De Dapper and his team will be supported by a series of augerings inside the urban area and near its fringes to establish possible reasons for (changing) city size, taking into account river course fluctuations, specific soil conditions and sea level change.

The survey results of fields surrounding the urban site of *Potentia* were most relevant for our knowledge of the suburban and rural hinterland of town. Immediately to the north of the colony, an *extra muros* settlement area could well be distinguished. It borders the Roman coastal road identified on our aerial photographs and was lined with one or probably two funerary monuments, of which we found clear surface indications in the shape of many fragments of limestone. Excavations in the 1960's and 1970's have indicated that this area was further extended with a large cemetery, used between the 2<sup>nd</sup> century BC and the 4<sup>th</sup> century AD.<sup>36</sup>

The Roman road, which we discovered from the air in 2000, leaving the presumed southern gate in a south-western direction to the Roman bridge at Casa dell'Arco, was well recognized in the field. It is bordered by at least five funerary monuments of which we found clear surface indications: fragments of architectural blocks of marble and limestone, some fine and common Roman pottery and especially many fragments of amphora sherds. The latter were probably foremost used here as building materials. Immediately north of this road, which possibly linked *Potentia* to the nearby town of *Pausulae*, we located several suburban settlement zones. Finally, also along the Roman coastal road leading from *Potentia* to the south, which we discovered from the air in May 2002, we now located several suburban settlements. The fine chronology of these needs to be further established.

The survey data from the remainder of the territory of *Potentia*, at some distance from town, are still limited (see above). Nevertheless, systematic line walking procured already some 15 new settlement sites and possible settlement sites of Roman date. Added to some seven settlement sites known from earlier research and chance discoveries in the area<sup>37</sup> this brings the total of probable Roman farms in the neighbourhood of *Potentia* to more than 20. Although it is clearly too early to come to conclusions about the site distribution in the landscape – a second field season involving all landscape types is needed in this wide area – some preliminary remarks can already be made.

A first emerging pattern is that of a series of coastal sites lined along the Roman coastal road to the south and mostly situated on top of ancient beach ridges. It is clear that at least some of these settlements are partly linked to amphora production. On one site, identified in the 1970's as a 'Roman villa',<sup>38</sup> we now clearly recognised remains of amphora production in the shape of walling of possible workshop structures and a thick layer of oven residues and partly over baked amphora fragments. On other sites the concentrations of amphora fragments in the surface scatters was so dense that again production and/or at least a secondary re-use of amphorae for construction activities seems evident.

A second important observation is that, contrary to the protohistoric situation, Roman farm sites were also found in the coastal plain itself. Although their number could have been restricted, this seems to indicate that we must leave the general assumptions that such sites were or buried too deep to be found by superficial prospection, or

not present at all. It seems that the Roman centuriation of the plain and other land improvements has made this fertile but easily flooded valley floor widely available for habitation and systematic agricultural exploitation. Further surveys combined with geomorphologic corings and ancient land evaluation are awaited before any firm conclusions can be drawn here.

Thirdly we can already notice that some villas and larger rural settlements are located on the foot slopes of the hills, just outside the centuriated agricultural plain. One of them, located at the foot of the Monte dei Priori, has an extension of more than 110 m and revealed indications for wealth (a great variety of building materials, much fine pottery, a local aqueduct, etc.) and a long occupation continuity, from late Republican times into the late Roman period (5<sup>th</sup>-6<sup>th</sup> century). This occurrence of late rural presence in the territory seems to confirm some form of city-occupation at *Potentia* into the early 7<sup>th</sup> century AD. As the processing of the surface finds is still in its initial phase, it is still too early to evaluate the finer chronology of this distribution pattern.

#### PRELIMINARY DISCUSSION OF THE FINDS OF FIELD CAMPAIGN 2002

Patrick Monsieur, Hélène Verreyke & Catharina Boullart

#### Introduction

The field campaign 2002 was concentrated on the intra-site surveys of two known sites in the lower Potenza valley, namely the ancient town of *Potentia* and the pre- and protohistoric site of Montarice. Systematic survey was also conducted in the broad basin of the lower valley, but was not yet completed. Therefore, the presentation of the material collected during the 2002 campaign is focused on the finds of these intra-site surveys. The other material of the lower valley will be discussed in the 2003 preliminary report, when the survey of this region will be completed. We will however also do some preliminary observations about a series of finds from smaller sites in the area.

The intra-site survey of Montarice yielded a great amount of Bronze and Iron Age material, as well as some finds of the Roman period. The Bronze Age ceramics consist of elaborately decorated pottery like S. Paolina di Filottrano ceramics and a wide range of peculiar forms, from horned handles to perforated spouts. Among Iron Age finds, an appreciable quantity of black glazed pottery turned up, most of them of Greek origin.

This pottery bares a great variety of decorations, some of them undoubtedly indicating black- and red-figured vases. The finds confirm the known importance of this hill site. The analysis of the results of this intra-site survey will contribute to establish the degree of conservation of the site and will help to explain internal differentiations of the site.

The area of *Potentia* was also subjected to an intense intra-site survey. The surveyed area incorporated the ancient town, as established through aerial photography and ongoing excavations, as well as the region west of it. The finds, building materials, pottery and glass were naturally more abundant *intra muros* than in the western survey section outside the town. Building materials include purely constructional material, such as hexagonal tiles and a tegula used for erecting columns, and decorative building materials like tesserae, stucco and pieces of fresco. The pottery finds show the full chronological range of the existence of the ancient town of *Potentia*. The Republican period is well represented by Campana ware<sup>39</sup> and amphorae. The Early and High Imperial periods are represented by North Italian and Eastern terra sigillata (including stamped examples), terra sigillata medio-adriatica, thin walled pottery, plain and coarse wares and numerous types of amphorae of Italic and Aegean origin. The Late Imperial period yielded imported table wares like African Red Slip and Late Roman C, African lamps and late Roman amphorae of North African and Aegean origin. All the finds, building material and pottery, are closely related to the finds of the excavations in the north-eastern corner of *Potentia* conducted in 1967 and 1971 by L. Mercado and will be systematically confronted with them.<sup>40</sup>

#### *Current research and methodology*

Pottery analysis of survey material needs to be based on datable pottery sequences. Well dated regional reference sites are thus crucial for the identification, typology and chronology of the survey material. The archaeological sites of the lower valley of the Potenza river and of the Marches in general are fundamental archaeological sources not only for the pottery analysis of the PVS but for the whole of the Adriatic. Important Bronze Age and Iron Age settlements in the Marches are Moscosi di Cingoli (Macerata), S. Paolina di Filottrano (Ancona) and Colle dei Cappuccini in the city of Ancona. The extensive excavations conducted in Ancona prove this city

to be of main importance throughout prehistorical and historical times. The amphitheatre of Ancona revealed important information about the Greek colonization of the town and its development in the Roman period. Of importance, regarding the Late Imperial period, are 267 graves of a paleochristian burial-ground excavated at the Piazza Stamira in Ancona dated in the 4<sup>th</sup> and 5<sup>th</sup> century AD.<sup>41</sup> Rather well dated are the graves of the La Pineta necropolis, which is situated north of *Potentia*.<sup>42</sup> Between 1967 and 1971 the Soprintendenza Archeologica delle Marche excavated several sites which were endangered by agricultural activities. These sites, San Benedetto del Tronto, Cone di Arcevia, Castelfidardo, Cesano di Senigallia and Porto Recanati (*Potentia*), were published meticulously by L. Mercado.<sup>43</sup> Although these sites were damaged by agricultural activities destroying a great deal of the stratigraphic sequences, they remain of great importance for our knowledge of the Roman and Late Imperial period<sup>44</sup> in the Marche. As already mentioned, the intra-site excavation in the north-east quarter of the ancient town of *Potentia* is a crucial reference for the finds of the intra-site survey and will continuously be confronted with our results. The *villa* in Osimo at Monte Torto (Ancona)<sup>45</sup> and the *domus* in Suasa (Ancona)<sup>46</sup> were excavated more recently and thus provide useful dating agents. Of considerable importance for the early medieval period is the cemetery of Castel Trosino, dating from the late 6<sup>th</sup> to the middle of the 7<sup>th</sup> century AD.<sup>47</sup>

Material from the late antique and early medieval period requires special attention. Firstly there are the phenomena of imitation of imported wares from the late 4<sup>th</sup> century AD onwards. Imitation of African tableware in coarse or plain ware, with or without slip occur frequently.<sup>48</sup> Secondly there is the interesting interaction or alternation of the North African and eastern economic trade market, visible in the presence of specific pottery types.<sup>49</sup> It is rewarding to investigate this transitional period in view of the position of the Marche in the Gothic-Byzantine war (AD 535-553) and the arrival of the Longobards (AD 568). H. Verreyke started a doctoral thesis on the research of late antique and early medieval occupation patterns and trade routes in the Northern Adriatic, where pottery analysis is the main tool for answering questions regarding this subject. The intra-site survey of *Potentia* yielded a lot of late Roman pottery. A number of sherds was immediately identifiable as imported tableware and amphorae, while further study will need to be carried out on pottery classes like



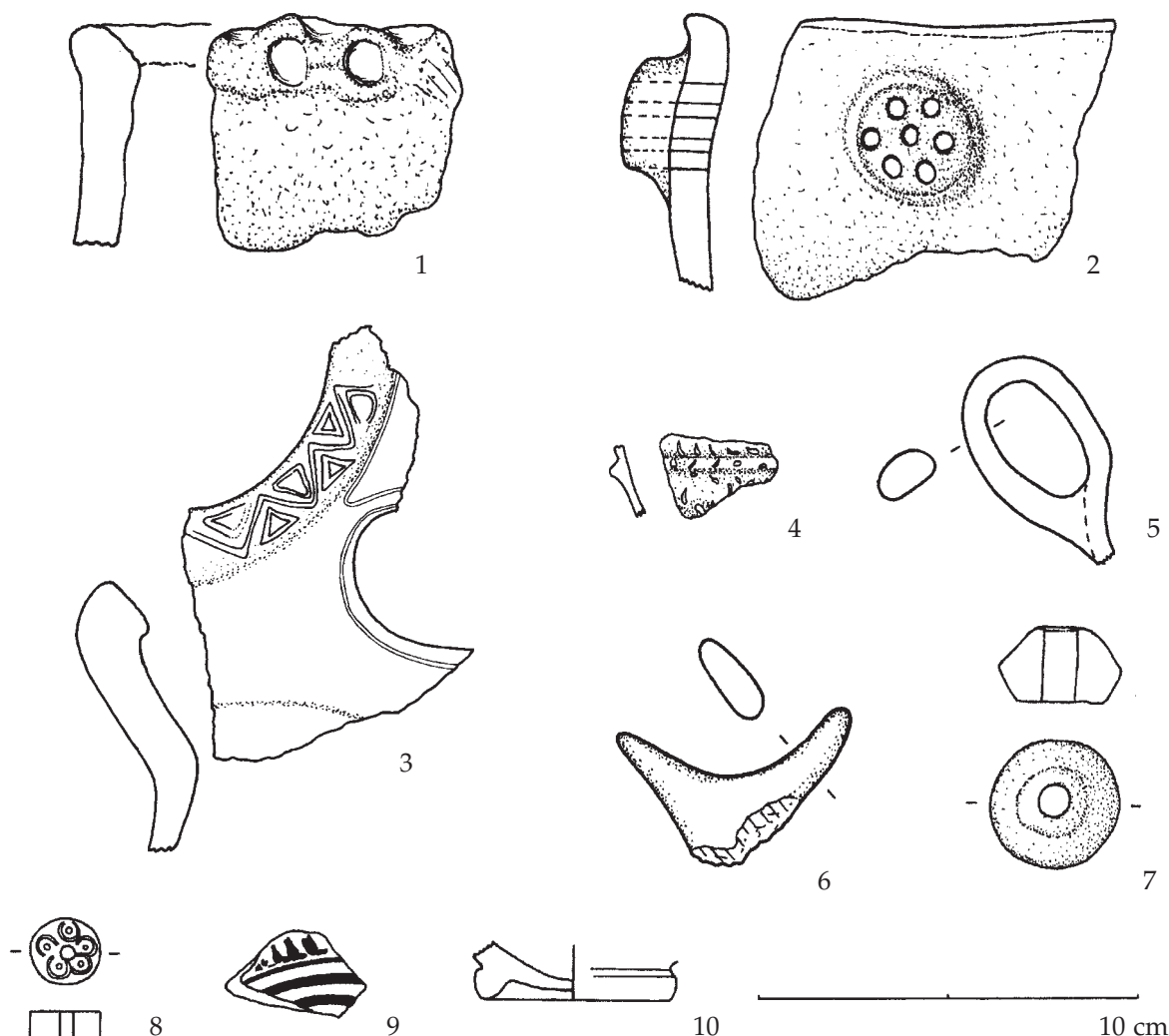


Fig. 11. Bronze and Iron Age: pottery, spindle whorl, bone or ivory disc and Greek imports from Montarice.

coarse wares (local, regional and imports) and imitations of imported wares. The identification of these groups opens the possibility to refine the date of sites where fine ware is absent.

The increasing and unexpected variety of amphorae finds, the difficulties of identification of the fragments, the need of comparison with complete or better preserved examples from the necropolis of La Pineta, the problems concerning the Adriatic origin of several types and finally the discovery of a production site near *Potentia* during the survey of 2002<sup>50</sup> urges to a new orientation in the study of this class of pottery. A new research program on amphorae will be worked out in the near future, focussing on Adriatic productions versus Italic and Aegean imports.

Due to the enormous number of finds recov-

ered during the 2002 campaign, the approach of the processing of the pottery was adjusted. The pottery was sorted in three classes: the bulk, diagnostic sherds and diagnostic sherds ready to be analysed. This third class was studied in detail, and a selection will be presented further on. The results of the pottery analysis are linked with the field observations through a Microsoft Access program. This database is based on three fields of information: the field form, the pottery analysis and the pottery identification. The chronological evolution of occupation patterns, based on dated finds, will be visualised by means of GIS (Geographical Information System) carried out by G. Verhoeven. An additional campaign in April 2003 was necessary to process all diagnostic sherds and to study the finds more in detail.<sup>51</sup>

*The finds from the intra-site surveys on Montarice and Potentia*

**Montarice**

As has been mentioned earlier in this report, the only excavation at Montarice yielded mostly Bronze Age material.<sup>52</sup> Also during the PVS survey obvious Bronze Age diagnostic material has been picked up on the total surface of the hill site. A peculiar find was an impasto fragment with cordon decoration (*fig. 11.1*) as has also been found at Monte Ingino<sup>53</sup> and a twisted handle for which a reference is obtained at Bachero di Cingoli.<sup>54</sup> In the middle of the southern edge of Montarice a fragment with perforated spout (*fig. 11.2*) with a reference at Cortine<sup>55</sup> was collected. D. Lollini<sup>56</sup> as well as R. Peroni<sup>57</sup> suggest a Sub-Apennine date (Recent Bronze Age - 13<sup>th</sup> century BC). In the north-western corner of Montarice we found part of a pointed horned handle with well defined semicircular sides, carrying typical Apennine incised decoration (*fig. 11.3*). Similar finds occurred at Moscosi di Cingoli,<sup>58</sup> Montefrancolo di Pollenza<sup>59</sup> and Monte Ignino.<sup>60</sup> It is referred to as the S. Paolina di Filottrano type<sup>61</sup> and can be dated at the end of the Middle Bronze Age. Another type of Apennine decoration consists of incised motives filled with bone or chalk powder (*fig. 11.4*). Similar finds were done at Monte Ignino<sup>62</sup> and at the settlement site of Fonte Maggio in the Biferno Valley.<sup>63</sup>

There is no specific mention of Iron Age material in the report of Lollini's excavation on Montarice, although she mentions the continuity of occupation in this period.<sup>64</sup> Apparently, two black-figured sherds and one red-figured sherd, now displayed in the Archaeological Museum of Ancona, were found in the vicinity.

The PVS survey has clearly confirmed an important human presence on the hill during the Iron Age. Typical finds are elements of black-burnished buccheroides wares. Several looped handles (*fig. 11.5*) from globular *kantharos*-like beakers match very well with examples from Cartofaro.<sup>65</sup> Also carinated wall fragments with their typical sharp edges are present. Of course most of the material of the Iron Age consists of plain and coarse ware, but they are not always distinguishable of Bronze Age material. This also applies to horned handles (*fig. 11.6*) and cylindrical ones and wall sherds with lugs.<sup>66</sup> It is our aim to establish a basic typology of the material in order to achieve a satisfying identification for Bronze and Iron Age on the site. Also spindle whorls, of

which a well-preserved plain example was discovered during the survey (*fig. 11.7*), are difficult to date objects when not found in context, as there seems to be little typological evolution.<sup>67</sup>

Among materials other than ceramics we can present a little bone disk (*fig. 11.8*),<sup>68</sup> with central perforation and a decoration of circles and dots. References to this kind of decoration on bone, ivory or horns and antlers (and even on bronze) can be found in abundance in Piceno,<sup>69</sup> e.g. at Monte Primo di Pioraco, Monte Croce Guardia di Arcevia, Monte Giove di Penna S. Andrea, Bachero and Moscosi di Cingoli and Colle dei Cappuccini in the city of Ancona.<sup>70</sup> The same decoration is also present on the Piceni black burnished buccheroides ware we found during the field campaign 2001 at the foot of Monte Franco di Pollenza (late 7<sup>th</sup> or first half 6<sup>th</sup> century BC).<sup>71</sup>

Montarice yielded also a reasonable number of imported wares, Greek and South-Italic in Greek tradition (Daunian and Messapian). Diagnostics and wallsherds of black glazed and black- and red-figured pottery suggest a chronology from the 6<sup>th</sup> until the 4<sup>th</sup> centuries BC. A wallfragment with floral band (*fig. 11.9*) of an archaic stemmed kylix can be dated in the second half of the 6<sup>th</sup> century BC. Several similar decoration motives are typical on Laconian ceramics,<sup>72</sup> but an Attic provenance should not be excluded. Indeed, a closer look to the fabric in the near future should lead to a more definitive conclusion, since the condition of survey material could have altered its nature. The profile of the ring-base (*fig. 11.10*), the decoration (*fig. 12*) and the diameter of an Attic skyphos point to a date in the 5<sup>th</sup> century BC.<sup>73</sup> An amphora handle and a rim, probably of the mushroom type, suggest a date in the 4<sup>th</sup> or 3<sup>rd</sup> centuries BC.<sup>74</sup>

Montarice revealed also indications for Roman occupation. Some black gloss sherds and Lamboglia 2 or Dressel 6a amphorae fragments refer to the Late Republican period. The Augustan and Tiberian age is represented by a precious millefiori glass fragment (*fig. 17*) and a North Italian terra sigillata wallsherd of a beaker, probably a Dragendorff 11.

*Potentia*

**Pottery**  
- Roman Republican

The survey intra muros revealed several black gloss sherds.<sup>75</sup> A rim of a plate F2233 can be dated in the 2<sup>nd</sup> century BC, whereas a rim fragment of a *pyxis* F7544 can only be assigned a general date



Fig. 12. Attic skyphos from Montarice.

in the 2<sup>nd</sup> or 1<sup>st</sup> century BC.<sup>76</sup> A reasonable number of amphorae fragments date from the 1<sup>st</sup> century BC. Several types of Italic origin, respectively for olive oil and wine can be distinguished: the Brindisian amphorae (fig. 13.1) and their imitations or followers called 'ovoidali adriatiche', the Lamboglia 2 and her follower the Dressel 6a, both difficult to distinguish when remaining in a fragmentary state. Some fragments of rims and spikes are to be compared with those found in the production site of Cologna Marina on the south coast of Le Marche (fig. 13.2).<sup>77</sup> The fragments also much resemble those found in the production site near *Potentia* that was discovered during this campaign. As in the examples of Cologna Marina the fabric contains nodules of 'chamotte'. The transition and/or coexistence of the Lamboglia 2 and Dressel 6a amphorae is situated around 50 BC. Some amphorae fragments can be identified as part of Greek Hellenistic amphorae, maybe of Cnidian and Rhodian origin. One handle fragment of a Coan amphora dates from the 2<sup>nd</sup> century or the first quarter of the 1<sup>st</sup> century BC (fig. 13.3). Some ceramic bungs of amphorae or *opercula* were picked up, two of them intact and of different types. The first type is a disk with a knob. Relief lines divide the surface of the disk in triangular zones, sometimes filled with an eroded letter or a sign. The second type is massive and has a conical profile ending in a broad knob. It is not clear which types of amphorae they have shut, but we suspect the first *operculum* type belonging to Lamboglia 2 as they occur regularly on Delos. The destruction

dates of 88 and 69 BC of this site need to be stressed (fig. 13.4). A base of an *unguentarium*, probably of local origin, is of the 2<sup>nd</sup> or 1<sup>st</sup> century BC, possibly even of Augustan age (fig. 13.5).<sup>78</sup> At this very moment no survey material was recognised as certainly earlier than the time of the foundation of the colony in the first quarter of the 2<sup>nd</sup> century BC.

#### - Roman Imperial

Because of the sheer quantity of material from the Early and High Imperial period that was recovered during the city survey, only a minor part of the finds was submitted to a preliminary study. Nevertheless it seems that not much fragments of 'pareti sottili' and lamps were picked up. This might be explained by a lack of visibility due to their fragmentary condition and maybe to the colour of the fabric. On the other hand the terra sigillata is rather well represented, most of it from Northern Italy. Eastern sigillata is only present in very small wall fragments. Several pieces of terra sigillata medio-adriatica were also identified, some of them decorated with brown bands. Three stamps are recognised on the bottom fragments of unidentifiable terra sigillata plates. Two of them are readable, on two lines and dating from the Augustan age: L TETTI / SAMIA and SEX / ANNI with palm and crown (fig. 14.1). A production centre of *L. Tettius Samia* is localised in Faenza. We can imagine that the ports of the Adriatic played an important role in the export of his products that are widespread, even to the fringes of the Empire as in *Iudaea* or in *Belgica*.<sup>79</sup> A rimfragment with an appliqué of a palmet belongs to a Dragendorff 17b plate (fig. 14.2), middle Augustan to the end of the 1<sup>st</sup> century AD. A wallfragment with an appliqué of a volute seems to match with Forma XXIX, 4 of G. Pucci, dating from the first half of the 1<sup>st</sup> century AD (Fig. 14.3).<sup>80</sup> An interesting rimfragment of a thin walled beaker can be compared with a Campanian model Tipo 2/389. As was expected different fragments of Firmalampen (fig. 14.4) turned up, and two rimfragments of type Loeschke Ic.<sup>81</sup> Roman plain and coarse wares are hard to identify. We could make some links with pottery types from sites like Castelfidardo, Cone di Arcevia and Porto Recanati (*Potentia*). Amongst the identifiable pottery stands out the plain ware vessel with a rim decorated 'a ditate' as found in Porto Recanati (*Potentia*) (fig. 14.5). Also two pieces of a type of coarse ware with a ribbed rim and impressed decoration below the rim, were collected. This kind of pot-

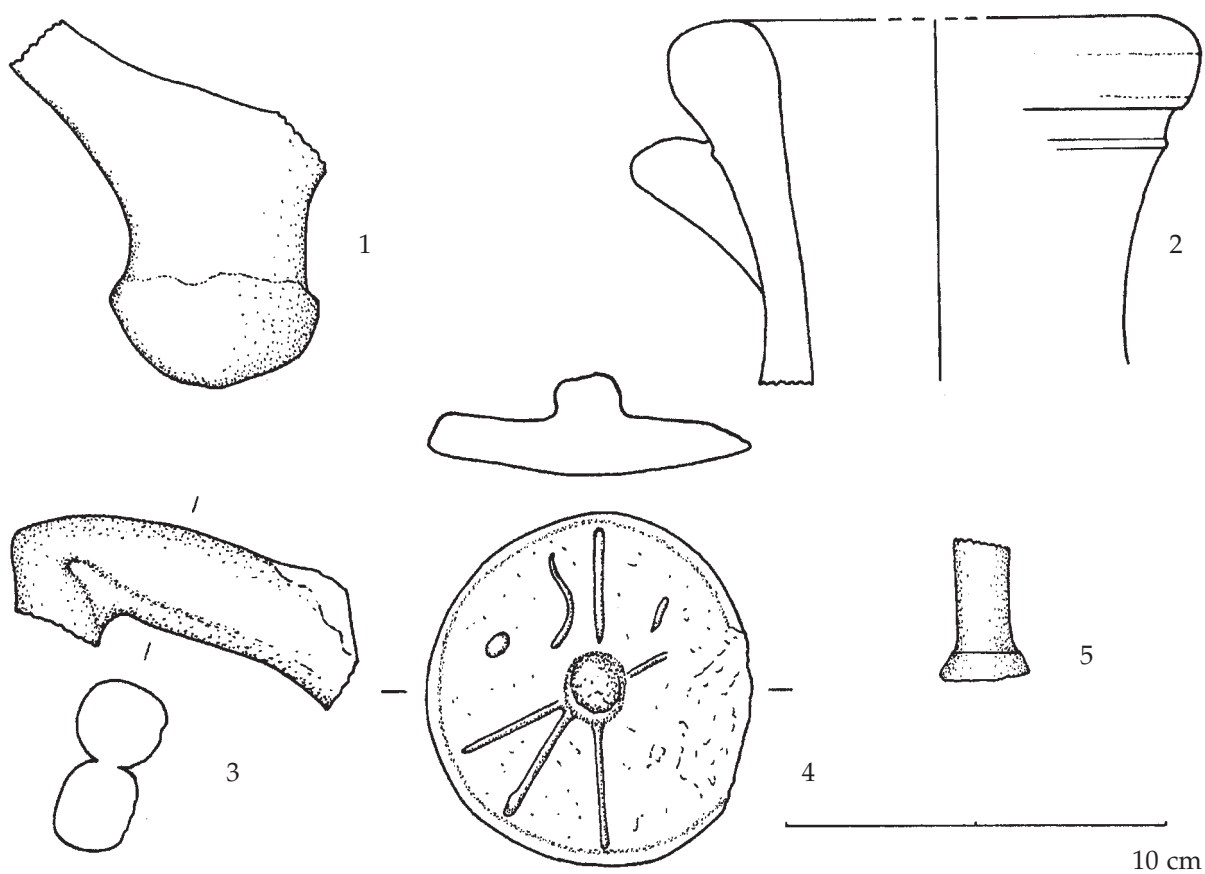


Fig. 13. Roman Republican: Adriatic and Greek amphorae, operculum and unguentarium from Potentia.

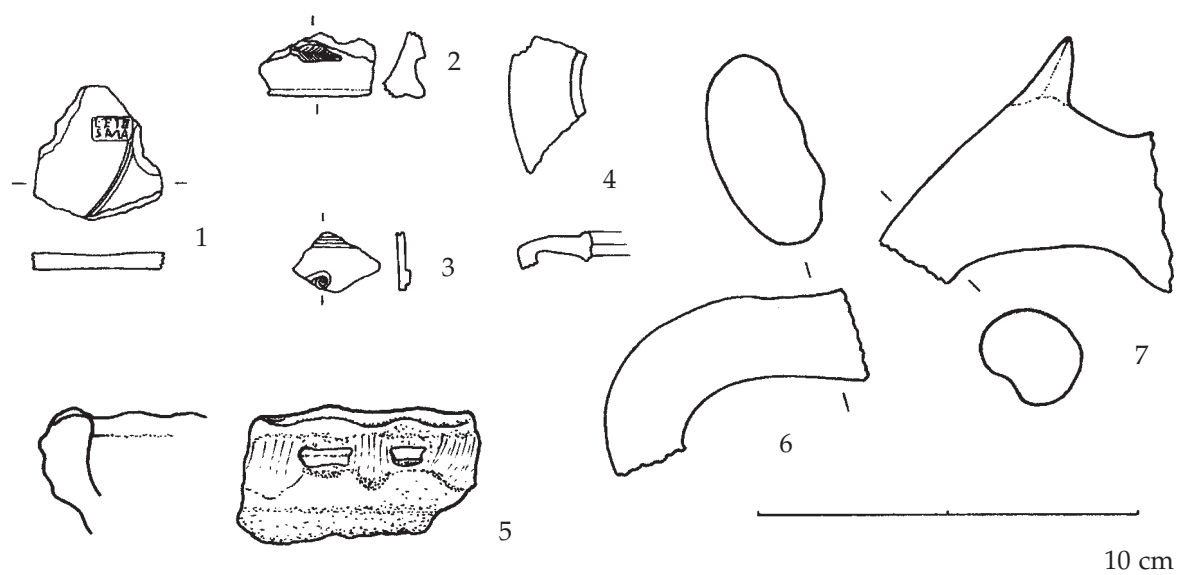


Fig. 14. Roman Imperial: terra sigillata, Firmalamp, plain ware 'a ditate', Forlimpopoli and Cretan amphorae from Potentia.



tery with a dark red, brown to grey fabric was also uncovered in Porto Recanati (*Potentia*).<sup>82</sup> A great variety of jug fragments offers possibilities to build up a typological series. Amphorae are abundant, and at least 8 types are to be distinguished. As in the Republican period three main groups can be made. There seem to be local and regional production, exemplified by Dressel 6a wine-amphorae that continue to be produced in the Early Imperial period, and probably also a new type with a funnel rim, 'a collo ad imbuto', sometimes labelled as 'Picenean' amphorae, used for the transport of olives and olive-oil. Possibly Dressel 6a amphorae were also produced in the Northern Adriatic, which is certainly the case for Dressel 6b olive-oil amphorae. The latter type is also a common find in *Potentia*. Two stamps on the rim, not yet deciphered, can be assigned to this amphora type. The fabric and the filler of some Dressel 2-4 amphorae point also to a local production, not surprising since this 'Coan' type of wine amphora is the most imitated in the ancient world. Two wall sherds betray the presence of Campanian 'black sand' Dressel 2-4 wine-amphorae. In the later 1<sup>st</sup> century AD a new type of wine-amphora with a small ring-base appeared, the Forlimpopoli-type, most probably the follower of the Dressel 6a. First produced in Forlimpopoli, its success seemed to have unchained lots of imitations in different regions of ancient Italy. As survey material they are very difficult to distinguish from plain ware (fig. 14.6).<sup>83</sup> Finally the Aegean imports continued. Very common in the Roman empire, from the Augustan age onwards, is a new, smaller type of Rhodian amphora, fragments of which occur regularly in *Potentia*. In fragmentary state there can be confusion with the amphora type Knossos 66, maybe also Rhodian and as the form suggests used for transport of fish-products. Another wide-spread Greek amphora, but less common, is of Cretan origin and very peculiar with its horned handles. Two well-preserved examples were already discovered in the necropolis of La Pineta. The Amphore Crétoise 4 or Dressel 43 is a wine-amphora mainly produced in the 1<sup>st</sup> century AD (fig. 14.7).

#### - Late imperial

The 2002 field campaign of the Potenza Valley Survey was very fruitful regarding the search for late Roman presence in the Marche. Many types of late Roman pottery came to light. But as mentioned before, further research will be necessary to analyse the imported wares and their regional

imitations. Different types of African Red Slip production C and D were found, mostly in the northern, eastern and southern part of the intra-site survey, that is to say inside the boundaries of ancient *Potentia*. A large bowl ARS C type Hayes 45B is an example of the production of the 3<sup>rd</sup> to the first quarter of the 4<sup>th</sup> century AD (fig. 15.1). Several pieces of ARS D type Hayes 61B were collected. This type of flat-based dish was very common in the 5<sup>th</sup> century AD. Hayes 61 was often imitated in regional productions from the late 4<sup>th</sup> century AD onwards (fig. 15.2). An ARS C deep dish type Hayes type 84 with a grooved rim and an exterior wall decorated with feather rouletting dates from the 5<sup>th</sup> century AD (fig. 15.3). Also kitchenware executed in ARS was found, namely a part of a plate or lid type Hayes 182.<sup>84</sup> Several smaller pieces of African Red Slip bear stamps, if not useful for the typological identification they are fundamental for chronology. The full decorative program of African stamp types is present: a palm Hayes Type 3, concentric circles Hayes Type 27, concentric circles Hayes Type 36 combined with two crescents Hayes Type 74, a grille-pattern Hayes Type 69, a square decorated internally with concentric circles Atlante type 36 and a rosette Hayes Type 44B combined with a palm (type unclear) (fig. 15.5-15.10).<sup>85</sup> All stamp types were dated from the second half of the 4<sup>th</sup> century to the 5<sup>th</sup> century AD and were applied on ARS production D. Concerning tableware the African Red Slip is clearly the most abundant. We also came across several rim fragments, which resemble Late Roman C ware type 3<sup>86</sup> (fig. 15.11-15.12). This type of pottery from the eastern Mediterranean was imported in Italy mainly in the second half of the 5<sup>th</sup> to the first half of the 6<sup>th</sup> century AD.<sup>87</sup> Of considerable importance are also two fragments of late Roman lamps Hayes type II or Atlante X, most probably of African origin. This type of lamp is dated from the late 4<sup>th</sup> to the 6<sup>th</sup> and even the 7<sup>th</sup> century AD, whether or not in regional imitations.<sup>88</sup> The first fragment consists of a part of the handle and the rim of the disk. The rim is decorated with a triangle motif (Ennabli D8) alternated with a square combined with a circular motif (Ennabli A4) (fig. 15.4).<sup>89</sup> The second fragment consists of a part of the nozzle and a part of the disk. The rim of the disk is decorated with a ribbed motif for which no exact parallels were found yet.

Finally different types of amphorae were distinguished. Most of them can only be assigned a general date in the 3<sup>rd</sup> to 5<sup>th</sup> century AD. Several spikes and rims surely belong to so-called *spatheia*,

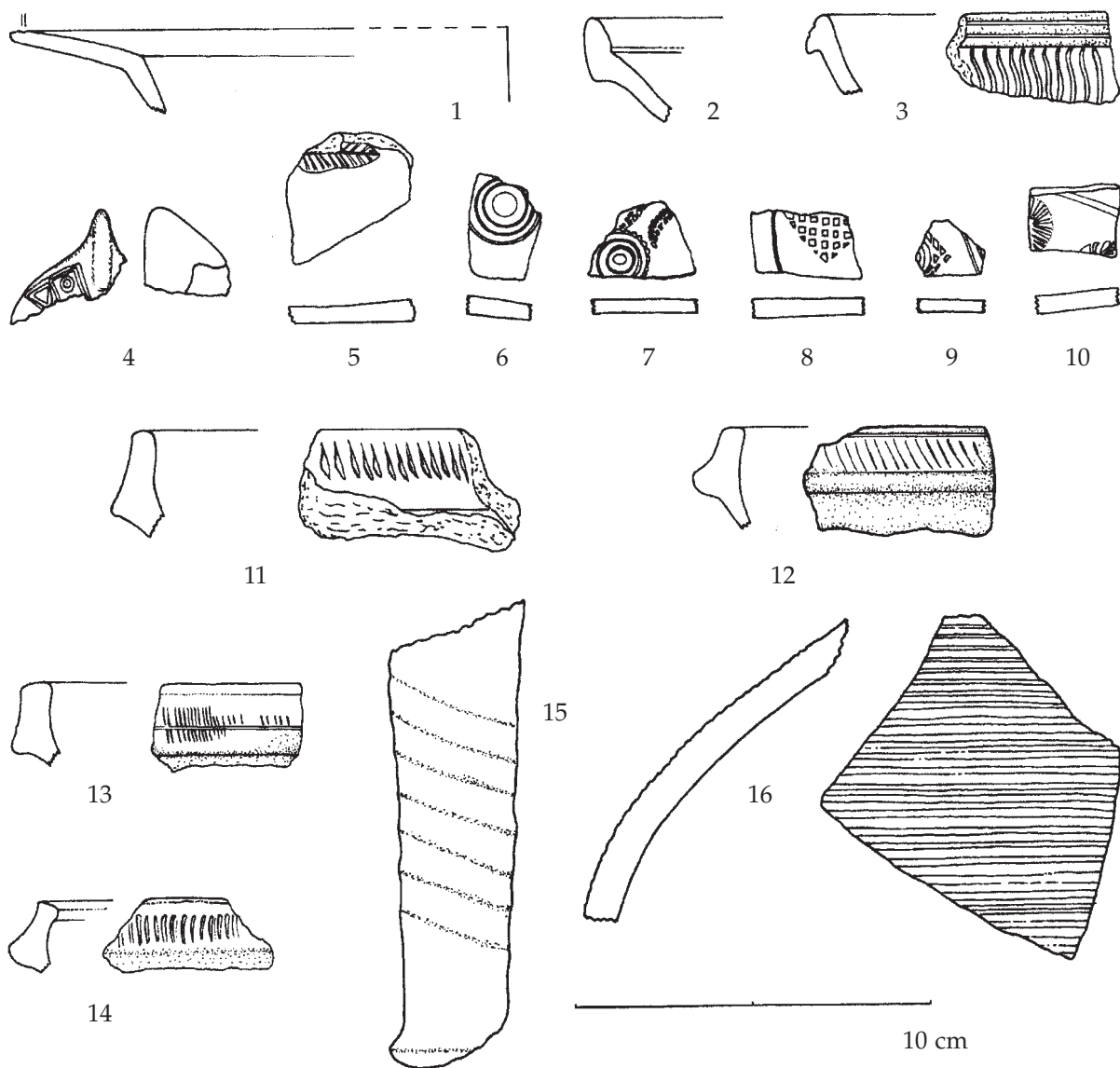


Fig. 15. Late Imperial: African Red Slip ware, African lamp, tableware in Late Roman C tradition, spatheion and Late Roman 2 or 5/6 amphorae from Potentia.

small fusiform amphorae originating of *Africa*, maybe transporting fish-products. Several of them already came to light in the excavations of Cone di Arcevia and in those of the north-eastern sector of *Potentia* (fig. 15.13). But some rims could be classified in the group of African 'cylindrical' amphorae clustering around the type Keay XXV. Late Roman 1 amphorae, most probably of Cilician or Cypriot origin, are represented by some typical handle fragments. A number of wheel-ridged or combed wall sherds can be ascribed to the bag-shaped Late Roman 5/6 of Egyptian origin or to

Late Roman 2 amphorae. The first was undoubtedly used for the transport of wine, but what the latter transported remains unclear. The fabric, a gritty, hard-fired, orange-red clay, the creamy white slip and the inclination of the shoulder fragment makes an attribution to the Egyptian type more probable (fig. 5.14).<sup>90</sup>

#### *Building material*

Two hexagonal tiles were found in the eastern area of *Potentia* in two adjacent blocks.<sup>91</sup> This

kind of tiles was used as flooring. Apparently this technique was used during the Roman period, in the Marche, in Emilia-Romagna and Veneto.<sup>92</sup> In Suasa (Ancona) six different types of hexagonal tiles were distinguished. Our examples match type D or the elongated variant F of Suasa (*fig. 16.1*).<sup>93</sup> Besides black and white *tesserae*<sup>94</sup> the survey also yielded a bright blue glass paste mosaic cube.<sup>95</sup> The black and white *tesserae* much resemble the floor decoration of room O in the southern building in the north-eastern area of *Potentia*, excavated by Mercado.<sup>96</sup> In the northern section of the intra-site survey a triangular *tegula* was found like those used for the construction of columns in the portico of the central temple area of *Potentia*.<sup>97</sup> Amongst the finds were also pieces of stucco, sometimes painted in a dark red, dark blue or purple.<sup>98</sup> One of the tiles bore the stamped inscription TI[. Apparently there are two possibilities to reconstruct the name: TI[BERI PANSIANA] or TI[BERI CLAUDI PANSI] (*fig. 16.2*). If this reading is correct the tile has its origin in the Northern Adriatic, most probably in the Po-valley, and considering that the *figlina* Pansiana was in imperial possession it can be dated in the first half of the 1<sup>st</sup> century AD. The type seems to occur at different places in the Marche.<sup>99</sup>

#### *Other finds*

Different fragments of glass were discovered. A green-glass broad combed handle belongs to a typical square or cylindrical bottle, Ising forms 50 or 51, to be dated in the 1<sup>st</sup> or 2<sup>nd</sup> century AD. Some bottoms of glass *unguentaria* can be compared with the material of the necropolis of La Pineta. No parallel was found for a blue glass handle. A fragment of a gorgeous blue-white 'millefiori' pillar-moulded bowl (cf. Isings form 3), dating from the first half of 1<sup>st</sup> century AD turned up at the hill-side of Montarice (*fig. 17*).<sup>100</sup> Next to the Roman road located on aerial photographs two marble or white limestone fragments of a profiled basis from a presumed funerary monument where found. They resemble much to a profiled base discovered in the north-eastern sector of the city.<sup>101</sup>

GIS AND ITS APPLICATIONS IN THE POTENZA VALLEY SURVEY PROJECT

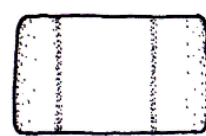
Geert Verhoeven

Reading this contribution, one must yet be convinced that the amount of gathered information in the Potenza Valley Survey is substantial. Man-

aging such quantities of - almost all geographically linked - data has become much easier with the introduction of GIS (Geographic Information System). Linking spatial data to non-spatial (attribute) data, GIS has become a commonly used management and analysis tool in a lot of disciplines, for at least the last fifteen years.

#### *Structure of the GIS*

From the beginning of the project, it was the aim to incorporate all gathered field, aerial, geomorphological and historical survey data into a GIS-context. In fact, before data could be managed and analyses computed, the building of the GIS had to occur. Working with different researchers in different disciplines, each of them with own particular data, a centralization of all information seemed to be necessary. Therefore, one central PC was purchased and configured to contain all possible data in an orderly and easy accessible way. On this computer,<sup>102</sup> a new disk partition - called Potenza Valley Survey - was created, which afterwards became subdivided into different directories and several subdirectories (*fig. 18*). Besides functional considerations, the total structure was also determined by the GIS-software used (ESRI ArcView 3.2). In this structure, four broad categories can be distinguished: 'GIS-data', 'GIS-projects', 'Non-GIS-data' and 'Temporary files'. The latter is only used in the making and adaptation of files.



5 cm

1



2

*Fig. 16. Roman building material: hexagonal floortile and North-Adriatic stamped roof tile from Potentia.*

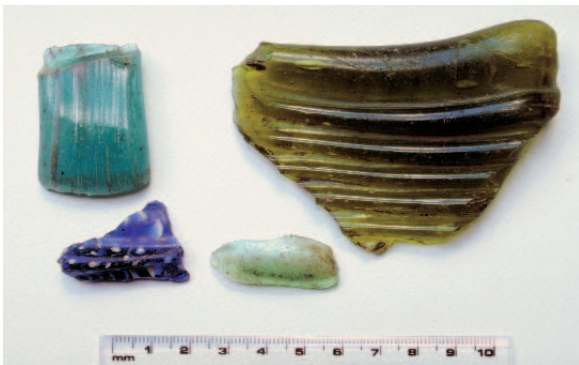


Fig. 17. Roman glass finds: 'millefiore' vessel from Montarice; handles of globular flask and of square or cylindrical bottle and bottom of unguentarium from Potentia.

GIS-data contains four subdirectories. The first, 'Databases', still contains several individual databases, although they should lead to one, all-embracing database. 'Vector data' is split in different geographical areas: 'World', 'Europe', 'Italy' and 'Regione Marche'. The latter contains - not surprisingly - most files. Using digitised topographical maps (scale 1/10,000, CAD-format) from the Regione Marche, different individual layers (land-use, contour lines, recent habitation, rivers, lakes, etc.) were created. Where needed, manual digitizing (with digitizer tablet or on-screen) completed the vector data.

However, spatial data can also be stored as raster, a fundamentally different format. In ArcView, a distinction is made between raster images and raster maps, also called grids. This division was adapted in the PVS-data structure. Till now, the number of grids is very limited (some DEMs and distance grids). In consequence, a further subdivision was not performed yet, in contrast with the subdirec-

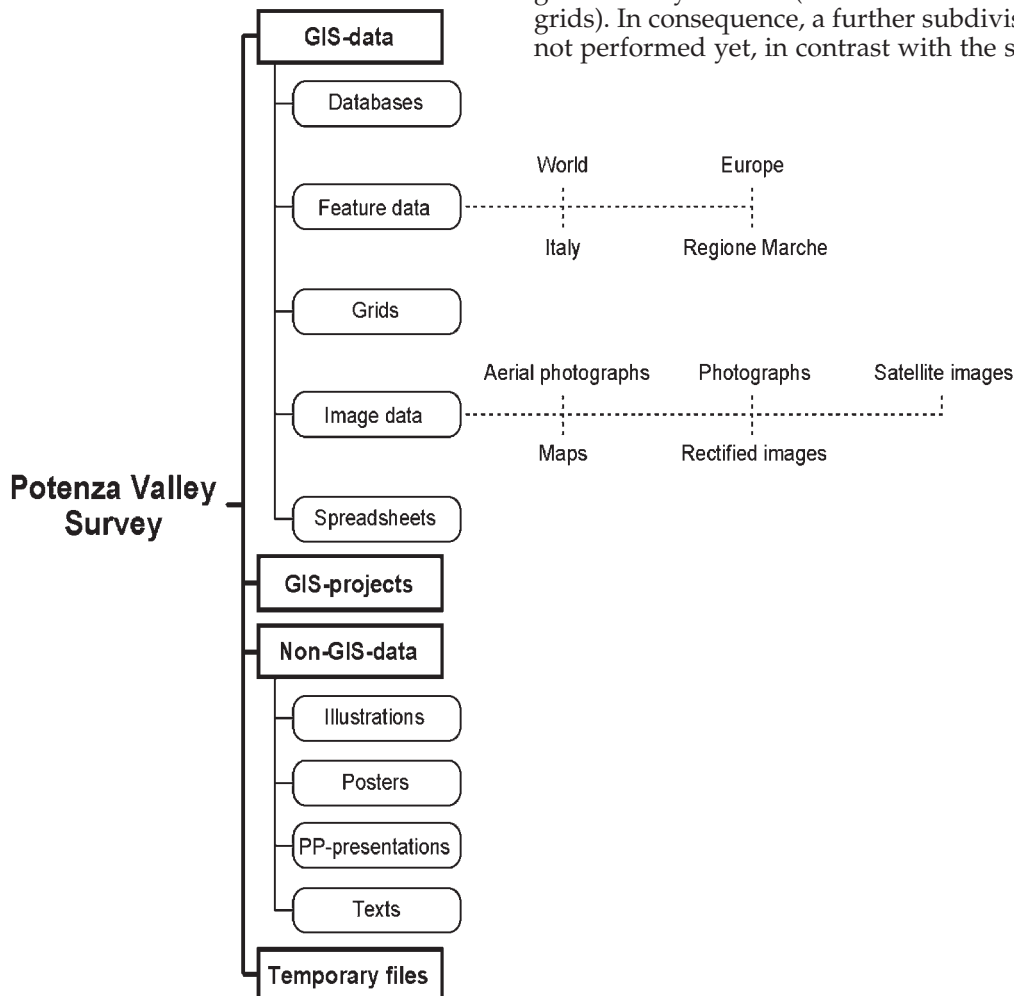


Fig. 18. Directory structure of the central PVS PC.



tory 'Image data'. Besides the huge collection of aerial photographs and on-ground photographs (mostly of artefacts), we have some scanned maps (topographical, orthophoto and cadastral), a few satellite images and a - fast expanding - number of rectified images as well. At last, some spreadsheets, generated by analysing various figures, complete the GIS-data at present.

The different ArcView-projects that are - and will be - made with all survey data are stored in the folder 'GIS-projects'.

Finally, 'Non-GIS-data' serves as a directory to hold various kinds of data about the survey project: 'Illustrations', 'Posters', 'PowerPoint presentations' and 'Texts' that were created with the PVS as subject.

#### *Metadata and quality control*

The results one can obtain using a GIS largely depend upon the quality of the (spatial) data that are used. After all, it is possible to have 'error free' attribute data (in terms of the method employed), but impossible to have 'error free' spatial data. There will always be differences between the multi-dimensional reality and our representations of it. Therefore, the weakest part of almost every GIS is the entering of spatial information.<sup>103</sup> Quality-affecting factors that can be mentioned are the accuracy and precision of the source data, the interpolation methods employed, the scale of the data, the georeferencing system used, the data collection technique and the sampling strategy that are applied, the process of scanning and digitizing, etc. In this respect, two items are of the utmost importance: metadata and quality control.

Metadata are a description of objects, documents or services which may contain data about their form and content. It can be seen as 'data about the data' and describes the content, quality, condition and other characteristics of data. It provides us with information about the who, what, when,

where, why and how of a data set. In a GIS, metadata are often neglected. Unjustly so, because archaeological research is often undertaken by researchers using digital data created by others. The former have limited understanding about the limitations or purpose of that data. Therefore, documenting your data can be helpful to others and yourself (even the person who digitized the data, may forget items like the precision and the accuracy of the data, the area it covers, the date of creation, etc.) In consequence, proper metadata is critical in preserving the usefulness of data over time and it is crucial to supply all kinds of GIS-data with this information.

Different metadata standards exist. In the PVS, the geospatial data (any data with a geographical component) is documented using the Federal Geographic Data Committee's (FGDC) Content Standard for Digital Geospatial Metadata, which the Federal Geographic Data Committee approved in June 1998.<sup>104</sup> To build FGDC-compliant metadata, an easy-to-use application called the ArcView Metadata Collector was achieved (fig. 19), allowing to create metadata for any data type supported by ArcView.<sup>105</sup>

Besides metadata, quality control is another important topic in the PVS-GIS, because no map stored in a GIS is completely error-free. Data stored in a GIS have been collected in the field, have been classified, digitized, interpolated. During this process, errors are constantly generated. Error itself can be defined as the discrepancy between a given value and its true value (e.g. in reality a hill is 300m high, while the value 298m is stored in the GIS-data. This reveals an error of 2m). Using spatial data in a GIS-operation implies that errors in the input will propagate to the output of the operation. In this respect, the resulting output is a function of the input values and inaccurate input values will automatically affect the computed results.<sup>106</sup>

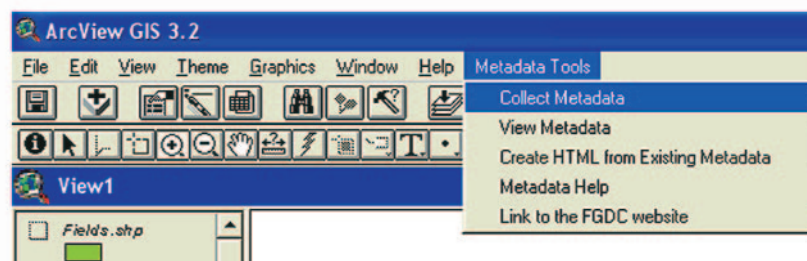


Fig. 19. The drop-down menu which appears in ArcView 3.x after installing the Metadata Collector.

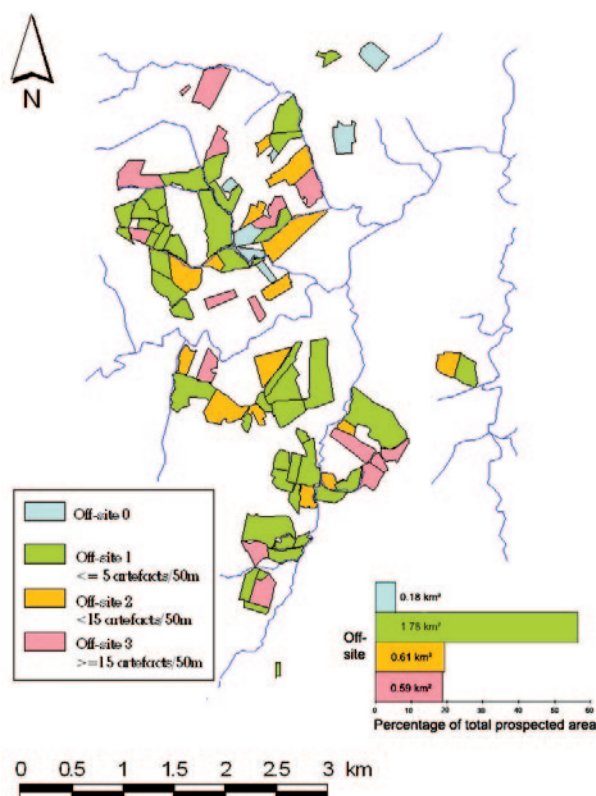


Fig. 20. GIS mapping of the off-site density of surface artefacts in sample zone 1 (Upper Potenza Valley).

Therefore, it is significant to test the accuracy of some digital maps. One example is the *Digital Elevation Model* or DEM. In the majority of GIS-data sets, the DEM is the most important layer. Besides giving information about the height, it is also used to generate slope and aspect and it serves as well as basis for *cost path analysis*, *distance calculations* etc. As a consequence, it is the fundamental basis to study the topographical features of archaeological sites.

To construct a usable DEM, an interpolation algorithm must be applied. Some digitized high points or contour lines always form the basis of the DEM, but they do not form a continuous surface with height values yet. To retrieve this, an interpolation method is run and will give the places without data a figure that represents the height at that place. However, different interpolation methods produce different terrain values. We must surely accept that the final DEM will be an approximation of a continuous phenomenon, but how closely this approximation reflects reality can be calculated.<sup>107</sup>

Presently, the accuracy of the DEM applied for the first sample zone was calculated. This control occurred on the basis of two tests: a qualitative and a quantitative one. In the qualitative test, the digitized contour lines were checked visually by generating a TIN (*Triangulated Irregular Network*),<sup>108</sup> where a closer look at the characteristic points and lines, the hillshaded relief as well as the slopes and aspects revealed some profound errors, owed to the manual labelling. Afterwards, a quantitative test was run. Eleven different interpolation methods<sup>109</sup> were executed. The predicted elevations for a given DEM were compared to some reference points (none of them was located on a contour line) and the discrepancy between both was calculated. With these figures, a global RMSE (*Root Mean Square Error*, which is mathematically the same as standard deviation) could be calculated for a given DEM. This procedure was repeated for each interpolation. Subsequently, different errors could be compared and the lowest RMSE revealed the preferable DEM. In the near future, homogeneous computations will be used to create the DEMs for the second and the first sample zone. Furthermore, it is also hoped some more digital files can be tested on their accuracy, as these tests really give a good idea of the quality of the files one is working with.

#### First analytical results

Setting up the GIS and on-going data-research are the main reasons why the GIS-analyses are still very limited and temporary till now. The executed computations presented here are all applicable to the first sample zone, the upper Potenza valley.<sup>110</sup> The analyses were divided into two parts: analyses of data linked with the cadastral maps and analyses of the environmental characteristics. The first part covered items as the calculation of the precise prospected area (3,2 km<sup>2</sup>), the determination of the proportional ratio of the visibility classes (19,6% bad; 3,4% moderate; 77% good) and the computation of the proportional ratio of the fields with erosion (29,9%). Furthermore, a *chi-squared test of goodness-of-fit* revealed for a *significance level*  $\alpha = 0,05$  that sites are equally distributed across fields with and without erosion. A determination of the off-site proportions (0 = 5,7%; 1 = 56,5%; 2 = 19,2%; 3 = 18,6%)<sup>111</sup> as well as a calculation and visualization of the total and periodical site density (total = 17,19 sites/km<sup>2</sup>; pre- and protohistoric = 3,13 sites/km<sup>2</sup>; Roman = 13,75 sites/km<sup>2</sup>; medieval and post-medieval = 1,12 sites/km<sup>2</sup>) complete this first

part. One can notice the high density of Roman sites. However, a further subdivision per period is needed and was obtained during the writing of this article.

The second part deals with the relation between the sites and the environmental characteristics as height, slope, distance to the nearest water source, etc. In an archaeological GIS, analysis of such environmental characteristics can occur in two different ways: the *contextual analysis*, which brings together the context of sites and the finds and analyses them without any proof (e.g. *site catchment analysis*) and the *locational analysis*, identical to the contextual analysis, except the attempt to prove the hypothesis.<sup>112</sup> It was the latter kind of analysis that was performed. All the analyses are based on a study by Hodder and Orton.<sup>113</sup> They examined the distribution of 173 Iron Age coin finds in relation to Roman road locations in central and southern England. Using manual methods of pre-GIS days, they performed a statistical analysis which revealed a significant association between the coin distribution and the Roman road network. With GIS, such analyses can be executed a lot faster and with results that are even more precise and accurate.

The distance to the nearest waterway was the first examined background feature. To illustrate, the first step is to create a distance grid, where every cell holds a figure that represents the distance of that cell to the nearest waterway. This grid serves as a background distribution. The distance of the sites to the nearest waterway can be extracted from this background distribution. Subsequently, the following question may be asked: is this a normal sample of the background or is the localisation of the sample cells (the sites) unusual in relation with our general background values (the study area)? Therefore, both the background and the sample values were plotted cumulatively and the *Kolmogorov-Smirnov one-sample* test computed. This test statistically compares the sample distribution against the background distribution and tells the researcher if the sample of site locations differs significantly from the total background. If it does, one can accept that the sites were placed in relation to the examined feature. If the difference between the two cumulative curves does not reach a critical value, one can accept that sites were placed at random considering the background feature.

In this way, the relation of the sites (per main period) and isolated finds to the following environmental characteristics was determined: elevation, slope and aspect; distance to the waterways,

to the Potenza, the springs and the total hydrographical network; distance to the nearest road, to the nearest flint; view on the Potenza. Some relations did occur (e.g. the isolated Stone Age artefacts were obviously linked to the springs and the Roman sites to the contemporary rural roads), but generally spoken, no specific connection between the environmental characteristics and the sites could be deduced for the moment, partly due to the fact that - as underlined before - the periods were too broadly delineated for detailed analyses.

### *Prospects*

In the near future, more and new analyses should replace these preliminary results, although the small number of sites for some periods will make analysis - even in the future - problematical.

For the moment, a new kind of analysis is in progress: rectifying oblique aerial photographs to map all crop, soil and shadow marks.<sup>114</sup> It is proposed to combine this highly significant new information with the other data, received from the field, geomorphological and historical surveys.<sup>115</sup> In this way, the capabilities and advantages GIS offers will be completely expressed in the PVS-project.

### ANALYSIS OF LITHIC ARTEFACTS FROM THE POTENZA VALLEY SURVEY. PRELIMINARY REPORT

*Philippe Crombé, Izabel Devriendt & Griet Vanheddeghem*

### *Introduction*

In 2002, all lithic artefacts recovered during the survey campaigns of 2000, 2001 and 2002 in three different core regions of the Potenza valley (Upper, Middle and Lower Potenza) have been analysed in terms of morpho-typology, raw material and physical condition (weathering). Altogether 2573 artefacts could be studied, among which 355 tools, the majority (ca. 65%) originating from the Middle Potenza area. In this first paper some preliminary results from the lithic analysis will be presented. A more detailed report will be published later.

### *Site distribution*

From a chronological point of view, all three core areas yielded artefacts belonging to different chronological stages of the Stone Ages. In the present state of analysis there are strong indications of a Middle Palaeolithic and Neolithic/Chalcolithic

occupation of the valley; the Late Palaeolithic and Mesolithic evidence on the other hand is still very discrete. Although several concentrations of lithic artefacts could be mapped, which might correspond to former camp or settlement sites, it is currently not possible to attribute these to a specific period. Indeed, it should be emphasised that all 'sites' were surveyed only once, hence the number of surface finds is still relatively low. At best one or two diagnostic artefacts are present, but considering that most localities may have been re-occupied at different stages, these cannot be used to date the assemblage as a whole. In order to gain more detailed information on site dimension, site chronology and site function further field work should be organised.

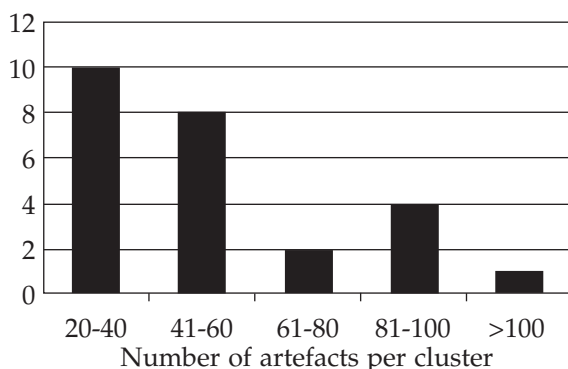


Table 1. Number of field clusters according to the amount of lithic artefacts found at the surface.

In total, 25 fields yielded clusters of lithic artefacts (table 1). Most clusters contain less than 60 artefacts. So far only one site situated in the Middle Potenza yielded a considerable number of finds (287 sp.). A detailed analysis of the spatial distribution of these clusters, using GIS, is currently in preparation, hence the total number of detected sites is not yet known. Indeed, it should be taken into account that several close-lying clusters may belong to one single occupation site. The vast majority of clusters was found in the Middle Potenza area, surveyed in the summer of 2001. The lower density of lithic concentrations in the Upper and Lower Potenza (respectively 2 and 1 cluster) probably can be partly explained by post-depositional processes, which are more active in these parts than in the Middle Potenza. In the hilly Upper Potenza with its steep ridges colluvial deposits may partly or completely cover prehistoric sites, especially in the low-lying parts of the landscape. In the Lower Potenza on the other hand sites may be sealed by fluvial and marine

deposits. Furthermore it should be stressed that field survey in this part of the study area is not yet finished; so far research has been focussed on two specific locations, i.e. the Montarice hill and the southern border of the Potenza. The remaining part of the Lower Potenza will be surveyed in the summer of 2003.

Awaiting the results of a detailed spatial analysis, it is already evident that the majority of prehistoric sites is situated along the Potenza river and its tributaries. In most cases prehistoric man settled on or in the immediate vicinity of gravel terraces, from which flint nodules of relatively good quality could be extracted.

### Description of the lithic finds

#### Raw material

All recovered artefacts are made in flint. On the basis of colour, texture, cortex and weathering a distinction between two main flint types can be made.

- *Type 1*: flint of fine-grained texture, generally homogeneously red to light brownish coloured, with strongly weathered and rolled cortex, which is often very thin (few millimetres). Some artefacts are more heterogeneous in colour, presenting a dominantly red colour spotted with lighter areas. Many artefacts in this flint type display a colour patina, mainly pink but incidentally also whitish. A colourless patina (gloss) also occurs frequently, either in combination with a colour patina or alone. In both instances, the gloss covers the entire surface of the artefact, indicating that it was formed as a result of a chemical weathering rather than a physical weathering (aeolian gloss). The frequent presence of frost damages, often patinated prior to the knapping, indicates that this flint type most likely originates from outcrops of secondary flint, e.g. former river terraces.
- *Type 2*: flint of fine to very fine-grained texture, beige to weakly brown-greyish coloured spotted with large white inclusions, provided with an intensively weathered cortex. Some artefacts present a weak blue-white patina. Although no evident traces of frost cracking are observed, the origin of this flint type is probably also situated in secondary outcrops.

Both flint types are absolutely predominant within all assemblages of the Potenza valley. A minority of artefacts is made of other flint variants, mostly of fine-grained texture, which present different colours (deep black with lighter spots, brownish or beige to whitish translucent flint).



## Typology and chronology

### - Middle Palaeolithic

Type	Upper	Middle	Lower
<i>Levallois-product</i>			
- flake	5	3	5
- blade			1
<i>Middle Palaeolithic points</i>			
- Mousterien point	1	1	
- Levallois point		1	
Middle Palaeolithic scrapers	4	5	4
<i>Middle Palaeolithic cores</i>			
- discoid core	1	10	2
- Levallois core	2	2	3
Handaxes	1	2	
Scrapers	17	16	3
Retouched flakes	50	141	18
Retouched blade(let)s	11	12	1
Becs (gravers) & borers	2	3	1
Burins	3	2	1
Various	1	1	1
Backed blade(let)s	1	2	
Truncated and backed blade(let)s	5	3	
Microliths		2	
<i>Arrowheads</i>			
- leaf-shaped	1	3	
- tanged	3	2	2
- tanged and barbs		3	
- lozenge-shaped	1	1	
Combined tools	1		
Indetermined tool (fragments)	6	16	2
Cores	16	43	8
Core rejuvenation products	10	6	3
Flakes	275	1254	287
Blades	6	5	2
Bladelets	60	78	2
Debris	24	24	7
Potlid	3		
Chips	21	12	
Hammerstones		2	
Retouched chips	1		
"Utilized" tools	3	30	
Total	535	1685	353

Table 2. Typological list of all lithic artefacts found in the three surveyed areas of the Potenza valley.

In total 53 artefacts could be assigned to the Middle Palaeolithic on the basis of technological and typological attributes. These include a number of typical Levallois products, such as 13 Levallois flakes with facetted or dihedral butt (fig. 21.1), 1 Levallois blade, 1 Levallois point and 7

Levallois cores (fig. 21.4). Among the latter is a very large specimen displaying all typical attributes of a Levallois core: plano-convex section, centripetal dorsal preparation, facetted platform, large Levallois flake negative. In addition to these Levallois cores, a number of discoid cores (13 sp.) are reported. Furthermore a few retouched artefacts display Middle Palaeolithic affinities. Some side-scrapers with scaled retouches may be of Middle Palaeolithic date (fig. 21.3). More convincing evidence includes two Mousterien points (fig. 21.2), of which one is made on a Levallois flake, and three bifacially worked artefacts. One of the latter (fig. 21.5) can clearly be determined as a small hand-axe made on a large flake. The majority (ca. 2/3) of these Middle Palaeolithic artefacts is heavily weathered i.e. covered by a gloss and/or colour patina formed after the manufacturing and use of the artefact. Hence, it can be assumed that other non-diagnostic artefacts presenting a similar patination can be of Middle (or even Late) Palaeolithic age too.

The best parallels for the Middle Palaeolithic artefacts from the Potenza valley are found within the Riss-Würm interglacial and Würmian assemblages, as found at various locations in the Marche region (Peretto 1990), such as Erbarella (Ancona) and Ponti di Crispiero (Macerata). These assemblages are characterised by the occurrence of a considerable number of Levallois implements, a good percentage of which is transformed to simply retouched tools.

### - Late Palaeolithic/Mesolithic

Except for a few isolated finds, no clear evidence of human occupation in these phases are reported in the collected surface finds from the Potenza. The nearly total absence of Late Palaeolithic finds is not at all surprising, since it is generally accepted that the population density in the whole of Italy at that time, in particular from the Aurignacian/Uluzzian till the Early Epigravettian (-16,000 BP), was extremely low (Mussi 2001, 209, 219). The only find that can be tentatively attributed to the Late Palaeolithic (fig. 22.6) is a patinated distal blade fragment with flat to oblique irregular retouches along both sides. The absence of clear Final Epigravettian/Mesolithic sites on the other hand most likely reflects biases in recovery, since it is clear that the smaller dimensions of the lithic industry, in particular of microliths, hinders the surface detection. So far the surveys only yielded two microlith finds - a crescent (fig. 22.7) and an undetermined fragment.

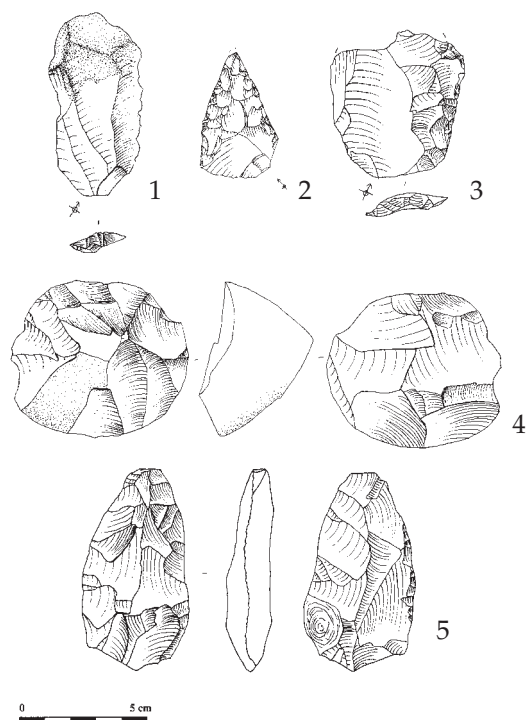


Fig. 21. Middle Palaeolithic artefacts from the Potenza Valley Survey.

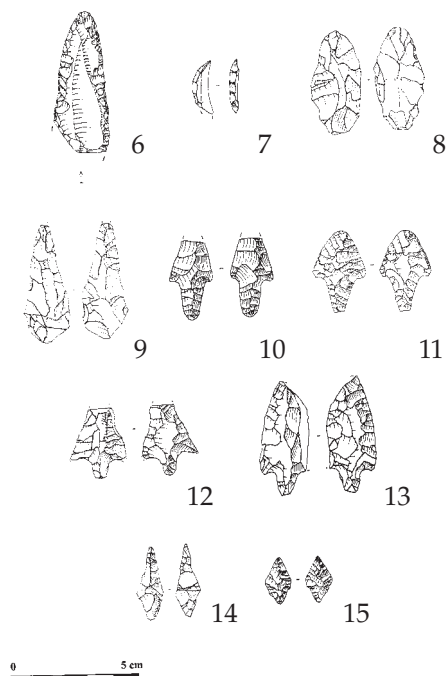


Fig. 22. Late Palaeolithic to Chalcolithic artefacts from the Potenza Valley Survey.

#### - Neolithic/Chalcolithic

The clearest evidence of human presence in the Potenza valley during the Neolithic/Chalcolithic is formed by a series of 16 flint arrowhead finds and pottery fragments. The arrowheads, all made by flat bifacial retouch, can be further classified typologically into four leaf-shaped (fig. 22.8-9), seven tanged (fig. 22. 10-11), three weakly barbed (fig. 22.12-13) and two lozenge-shaped specimens (fig. 22.14-15). Most of these projectiles have been found isolated, although some were collected within artefact concentrations and thus may indicate the presence of Neolithic settlement sites. The most convincing Neolithic site was found close to the southern edge of the Potenza river in the Upper area. The concentration of lithic and ceramic finds corresponds with a somewhat low-lying oval zone of darker grey earth and is threatened by modern gravel extraction. Another potentially Neolithic settlement location is situated north of the river in the Middle Potenza area. Here the so far largest surface assemblage was collected, including some 287 flint artefacts and a few ceramic finds. Here too the concentration coincides with an area of very dark greyish sandy clay, which may correspond to an old occupation layer being ploughed up. In the vicinity of this site, at Recanati 'Fontenocce' and Treia 'S. Maria in Selva' (Lollini s.a.), two Late Neolithic settlements have been excavated in earlier times, belonging respectively to the Diana and Ripoli culture. On both sites several arrowheads, comparable to our surface finds, have been reported. Also lots of artefacts in obsidian were found on these sites. It is surprising that this raw material is completely missing in the surface collection of the three surveyed areas.

#### ACKNOWLEDGEMENTS

The 2002 field survey was carried out within the Regione delle Marche and the PVS-team is very grateful to the Soprintendenza Archeologica delle Marche and especially to Soprintendente Dott. Giuliano de Marinis and Dottoressa Edwige Percossi, Ispettrice for the area, for their support and expertise. We also thank Dottoressa Mara Silvestrini for her help with the determination of prehistoric pottery.

In addition to the signatories of this article, the PVS-team of 2002 included: Joris Angenon, Sophie Dralans, An Van den Bremt, Maarten Weyler, Lieven Verdonck, Paul De Paepe, Julie Van Kerckhove, Nele Eggermont, Floor Van der

Meeren, Charlotte Denolf, An De Waele, Julie Luyts and Wouter Dhaeze.

The director of the project wishes to thank all participating members of the team and explicitly all voluntary archaeologists and students of archaeology and geography for their great and enthusiastic efforts.

#### NOTES

- <sup>1</sup> The project is directed by Prof. Frank Vermeulen and the principal archaeological investigators on the Belgian side include Catharina Boullart, Patrick Monsieur, Hélène Verreyke and Geert Verhoeven (Department of Archaeology, Ghent University, Belgium). For the geomorphological aspects close collaboration is obtained with a team headed by Prof. Morgan De Dapper and including Dr. Beata De Vlieghe and Tanja Goethals (Department of Geography, Ghent University) and Prof. Dr. Paul De Paepe (Department of Geology, Ghent University). The study of prehistoric stone artefacts was organised under supervision of Prof. Dr. Ph. Crombé (Department of Archaeology, Ghent University). The Soprintendenza Archeologica delle Marche actively supports the programme while additional help is supplied by the Universities of Macerata (Department of Archaeology) and Camerino (Department of Geology).
- <sup>2</sup> A substantial grant was obtained from the Belgian Federal Government (IUAP - PIA V/09). Other financial support comes from the Fund of Scientific Research – Flanders and from Ghent University (BOF-funds).
- <sup>3</sup> Vermeulen/Boullart 2001; Vermeulen/Monsieur/Boullart 2002.
- <sup>4</sup> It is the five year project 'Urban and rural transformation in the western and eastern Roman empire. Interdisciplinary archaeology of late antique and early medieval times' in collaboration with the universities of Leuven, Leiden and Louvain-La-Neuve.
- <sup>5</sup> Vermeulen/Boullart 2001, Vermeulen/Monsieur/Boullart 2002, Vermeulen 2002a.
- <sup>6</sup> To explore this potential further a series of flights were also organised above the more southern Marche valleys of the rivers Tenna and Aso, in close collaboration with a field survey team of the University of Pisa directed by Prof. M. Pasquinucci. Although results were also good here, particularly in the Tenna area, it is clear that the archaeological harvest in the Potenza valley is more impressive.
- <sup>7</sup> See particularly Vermeulen/Boullart 2001 and Vermeulen 2002a.
- <sup>8</sup> During the month of April both authors of this text were responsible for the photography, while F.V. took the pictures during the other months of aerial detection.
- <sup>9</sup> Vermeulen/Boullart 2001.
- <sup>10</sup> See below: contribution of Vermeulen/Boullart.
- <sup>11</sup> See particularly Vermeulen 2002a.
- <sup>12</sup> We regard the sites of *Dubios* and *Prolaquaeum* (Pioraco) in the Apenine area of the Potenza as road stations and not as real urban centers.
- <sup>13</sup> See especially: Bejor 1977, Moscatelli 1985 and 1988, Fabrinì 1990, Paci 1999 and Marengo 2000. Especially some aerial photo-interpretations by Moscatelli (1988) should be mentioned here.
- <sup>14</sup> A main part of this GIS analysis was done by Geert Verhoeven.

- <sup>15</sup> See also the contribution about the fieldwork below: Vermeulen/Boullart.
- <sup>16</sup> A second prospection campaign in the same zone is awaited for the late summer of 2003. The preliminary distribution map will then be completed and published.
- <sup>17</sup> See contribution by Goethals, De Dapper and De Vlieghe.
- <sup>18</sup> See Vermeulen/Boullart 2001, Vermeulen, Monsieur and Boullart 2002.
- <sup>19</sup> See contributions by Monsieur, Verreyke, Boullart and by Crombé, Devriendt, Vanheddegem.
- <sup>20</sup> Unpublished small-scale excavation by Lollini (Soprintendenza delle Marche) in 1976. See also Percossi Serenelli 1985.
- <sup>21</sup> Percossi Serenelli 1985, 134.
- <sup>22</sup> See also: Percossi Serenelli 1995, 41.
- <sup>23</sup> Baldelli 1991a, Baldelli 1991b, Baldelli 2001 and Luni 1992.
- <sup>24</sup> Luni 1992, 336-337.
- <sup>25</sup> Already in 1945 the top of this hill was flattened, but at that time Alfieri did not have any indication of proto-historic finds (Cass. 4, fasc. 3).
- <sup>26</sup> Vermeulen/Boullart, 2001, 11.
- <sup>27</sup> Baldelli 1991, 73.
- <sup>28</sup> See contribution by Monsieur, Verreyke, Boullart.
- <sup>29</sup> See for most recent assessment of the town data: Paci 1999; Percossi Serenelli 2001.
- <sup>30</sup> Alfieri 1947.
- <sup>31</sup> Mercado 1974b.
- <sup>32</sup> Mercado 1979.
- <sup>33</sup> Moscatelli 1987.
- <sup>34</sup> Paci 1995 and 1999.
- <sup>35</sup> Percossi 1995 and 2001.
- <sup>36</sup> Mercado 1974b.
- <sup>37</sup> We have almost finalised a complete inventory of old discoveries made in the three sample areas of this survey project of which data are available in the regional archaeological literature and archives. A gazetteer of these finds from the period concerned (1000 BC-1000 AD) will be published in the near future.
- <sup>38</sup> Mercado 1979.
- <sup>39</sup> See the separate study by J. Van Kerckhove in *BABesch* 2004.
- <sup>40</sup> Mercado 1979.
- <sup>41</sup> Pignocchi 1998; Luni 1991, 38, 39.
- <sup>42</sup> Mercado 1974b.
- <sup>43</sup> Mercado 1979.
- <sup>44</sup> The *villae rusticae* of Castelfidardo and Cone di Arcevia were occupied, or re-occupied, during the 4<sup>th</sup> and the first half of the 5<sup>th</sup> century AD and produce important reference material on the subject of late Roman pottery. Amongst the finds were terra sigillata medio-adriatica, African Red Slip, Late Roman C, *spatheia*, coarseware and coins.
- <sup>45</sup> Pignocchi 2001.
- <sup>46</sup> Dall'Aglio 1988.
- <sup>47</sup> Paroli 1995. Amongst the finds were coins, African Red Slip and *spatheia*.
- <sup>48</sup> Fontana 1998.
- <sup>49</sup> Reynolds 1995.
- <sup>50</sup> See contribution by Vermeulen and Boullart.
- <sup>51</sup> Many thanks to J. Angenon, who is responsible for the drawings of the material. The campaign of 2002 could rely on the experience of two years of processing the survey finds. The accuracy of the pottery analysis benefits from the continuity of the team. Moreover several studies were made concerning relevant subjects like the Roman villae in the Marche, a ceramics analysis of the Campana finds of the PVS and GIS applications in the Potenza valley. The pottery analysis also benefits from

- ongoing research-programs on the subjects of Piceni settlements in the Marche (Catharina Boullart) and late antique and early medieval occupation patterns and trade routes (Hélène Verreyke) and amphorae from the PVS (Patrick Monsieur). Fundamental is the collaboration with the Soprintendenza Archeologica delle Marche which will hopefully be expanded in the future.
- <sup>52</sup> See contribution by Vermeulen and Boullart. Unpublished small-scale excavation by Lollini (Soprintendenza delle Marche) in 1976. See also Percossi Serenelli 1985.
- <sup>53</sup> Malone/Stoddart 1994, 124, fig. 4.21-1, 3.
- <sup>54</sup> Lollini 1979, 199, fig. 6.6.
- <sup>55</sup> Lollini 1979, 183, fig. 2.11.
- <sup>56</sup> Lollini 1979, 179.
- <sup>57</sup> Peroni 1959, 111.
- <sup>58</sup> Silvestrini/Pignocchi 1999, 37, fig. 5.5.
- <sup>59</sup> Lollini 1979, 200, fig. 7.45.
- <sup>60</sup> Malone/Stoddart 1994, 120, fig. 4.17-71.
- <sup>61</sup> Silvestrini/Pignocchi 1999, 30.
- <sup>62</sup> Malone/Stoddart 1994, 120, fig. 4.17.
- <sup>63</sup> Barker 1995, 135, fig. 54.
- <sup>64</sup> Lollini 1991, 126.
- <sup>65</sup> Silvestrini Lavagnoli/Cazzella 1981, 153, fig. 2.
- <sup>66</sup> Bronze Age: Horned handles of Moscusi di Cingoli: Silvestrini/Pignocchi 1999, 37, fig. 5.2, 3 and 5.2.4. Horned handles of Monte Ingino: Malone/Stoddart 1994, 121, fig. 4.18-25. Lugs: Negroni Catacchio/Massari/Raposo 1999, 327, fig. 11; Negroni Catacchio/Cardosa/Domanico 1999, 433, fig. 7A; Bailo Modesti 1999, 448, fig. 8B. Iron Age: Horned handles of Ancona: Lollini 1956, fig. 9.7 and 11.7. Lugs at Monte Giove: D'Ercole/Cosentino/Mieli 2001, 341, fig. 85, 96, 97, 99 and 114.
- <sup>67</sup> Bronze Age: Bachero di Cingoli: Lollini 1979, 199, fig. 6.26. Iron Age: Colle dei Cappuccini (Ancona): Lollini 1956, fig. 10.10 and 11.10; Eroli 2001, 195, fig. 76-79. Cartofaro. Silvestrini Lavagnoli/Cazzella 1981, 157, fig. 39 and 40. Sirolo: Lollini 1985, fig. 15.10.
- <sup>68</sup> Diameter: 1,7 cm, thickness 0,7 cm.
- <sup>69</sup> Lollini 1956, 260, footnote 53.
- <sup>70</sup> Monte Primo di Pioraco: Lollini 1979, 186, fig. 3A2. Monte Croce Guardia di Arcevia: Lollini 1979, 188, fig. 4.3. Monte Giove di Penna S. Andrea: D'Ercole/Cosentino/Mieli 2001, 341, 342, fig. 111. Bachero: Lollini 1979, 199, fig. 6.3. Moscusi di Cingoli: De Marinis 2001, 47 fig. 28, 187 fig 32; Silvestrini/Pignocchi 1999, 44, fig. 9.8. Colle dei Cappuccini (Ancona): Lollini 1956, 259, fig. 14.
- <sup>71</sup> Vermeulen/Monsieur/Boullart 2002.
- <sup>72</sup> Stibbe 1972, fig. 126.2 and 127.2.
- <sup>73</sup> There is a close parallel with an example of the Athenian Agora, dated around 480 BC: Sparkes/Talcott 1970, 259, nr. 337, fig. 20.337; Stamires/Vanderpool 1950, 390, fig. 25 nr. 33.
- <sup>74</sup> Cf. types MGS IV or V: Van der Mersch 1994, 74, 77; see in last instance: Liko 2001, 265, fig. 1-c; see also Percossi 1995, 41.
- <sup>75</sup> J. Vankerckhove was so kind to provide the information. We already referred to the results of her study of the black gloss ware in this volume. For the black gloss pottery found in recent excavations in the centre of the city: Frapiccini 2001; Paci 2001, 101-102; Percossi Serenelli 2001, 42-45. Older excavations in the north-eastern sector: Mercado 1979, *passim*.
- <sup>76</sup> For these two fragments and the material to be compared, see J. Van Kerckhove in *BABesch* 2004 (n° 9 and 13).
- <sup>77</sup> Brindisian amphorae and 'ovoidale adriatiche': Baldacci 1972, fig. 1-3; Cipriano/Carre 1989, 68-80. Lamboglia 2 and Dressel 6a: Brecciaroli Taborelli 1984; Tchernia 1986, 53-55; Cipriano/Carre 1989, 80-88, especially fig. 12 with rims and spikes from the production of Cologna Marina. For a recent *status quaestionis* on the study of Adriatic amphorae: Starac 2001.
- <sup>78</sup> Coan amphora: Grace 1965. Amphorae bungs: Lilli 1994-1995; Gobbo 1998. Type 1: Delos: Bruneau 1970, pl. 46, n° D134-142. Type 2: Stefanini 1994-1995, 47, n°12 and fig. 16 (Senigallia); Mercado 1979, fig. 91 (San Benedetto del Tronto). Local production of unguentaria is attested in Aesis/Iesi, suspended in the first decennia of the 1st century AD: Brecciaroli Taborelli 1998, 214-216, especially fig. 113, n° 625b; cf. also Falconi Amorelli 1975, tav. LXXIII, n° 25.
- <sup>79</sup> L. TETTI SAMIA: Mercado 1979, 219, n°21, fig. 133 (*Potentia*); Fortini 1990, 52, n° 41, 63, fig. 15 (Cupra Marittima); De Visscher *et al.* 1955, 112, n° 19, fig. 28 (*Alba Fucens*); Hayes 2000 (Hrvar); Crowfoot/Crowfoot/Kenyon 1957, 296-297, n° 5, fig. 68 (*Iudaea/Samaria*); Vanvinckenroye 1985, 21-25, fig. 5, 6 (*Belgica/Tongerren*); SEX ANNI: Fortini 1990, 10, n° 3, fig. 1 (Cupra Marittima).
- <sup>80</sup> Dragendorff 17b: Mazzeo Saracino 1985, 201-202, n°18, tav. LXII, 2; cf. Malone/Stoddart 1994, 200, fig. 6.12, n° 17; Forma XXIX, 4: Pucci 1985, 393, tav. CXXVIII, 7.
- <sup>81</sup> Tipo 2/389: Ricci 1985, 299, tav. XCVI, 6, tav. CXL, 6. Lamps in *Potentia*: Ramadori 2001, *passim*.
- <sup>82</sup> Plain ware decorated 'a ditate': Mercado 1979, 253 fig. 162t, 254 fig. 164c. Coarse ware: Mercado 1979, 200 fig. 117f-g, 227 fig. 141g-h, 247 fig. 157q.
- <sup>83</sup> Dressel 6a: Carre 1985, 205-218; Cipriano/Carre 1989, 85-88. Dressel 6b: Carre 1985, 219-225; Bezeczky 1987, 6-21. Dressel 2-4: Campanian and other imitations: Panella/Fano 1977; Carre 1985, 226-228; Aldini 1978, 242-243, fig. 3, a. Forlimpopoli amphorae: Aldini 1978; Carre 1985, 228-231. Amphorae 'a collo ad imbuto': Carre 1985, 232-234; Bezeczky 1987, 34-36; Mercado 1979, fig. 138, 139 and 176. Rhodian: Empereur/Picon 1989, 224-225; Robinson 1959, 20. F94; Monsieur/Braeckman 1995, 294-295, fig. 1, n° 4; Monsieur 2001, 74, fig. 11; Hayes 1983, 151, type 25, fig. 24, A66 (fish-products?); Toniolo 1991, 34, fig. 30, 35 and fig. 31 (fish-products?). Amphore crétoise 4/Dressel 43: Marangou-Lerat 1995, 85-89; Hayes 1983, fig. 26-27; Toniolo 1991, 34, fig. 29; Mercado 1974b, tombs 40 and 52.
- <sup>84</sup> Hayes type 45B: Hayes 1972, 62-65, fig. 11; Atlante 1981, 63-64, tav. XXVIII. Hayes type 182: Hayes 1972, 201, fig. 35; Atlante 1981, 213, tav. CV3-5. Hayes type 61B: Hayes 1972, 100-107, fig. 16 and 17; Atlante 1981, 83, 84, tav. XXXIV, XXXV. Hayes type 84: Hayes 1972, 132, fig. 23; Atlante 1981, 69, tav. XXIX.
- <sup>85</sup> Rosette Hayes type 44B: Hayes 1972, 239, fig. 41; Atlante 1981, 129 n° 183, tav. LVIII. Grille-pattern Hayes type 69: Hayes 1972, 241, fig. 42, Atlante 1981, 125 n° 31, tav. LVI. Crescent Hayes type 74: Hayes 1972, 243, fig. 42m. Atlanta 1981, 128 n° 138, tav. LVIII. Concentric circles Hayes type 36: Hayes 1972, 237, fig. 40u-v; Atlante 1981, 125 n° 36, tav. LVI. Concentric circles Hayes type 27: Hayes 1972, 235, fig. 39y; Atlante 1981, 125 n° 11, tav. LVI. Palm type 3: Hayes 1972, 229, fig. 38 and 39; Atlante 1981, 127 n° 112, tav. LVII. Palm stamp types: Hayes 1972, 229-233, fig. 38 and 39; Atlante 1981, 127, 128, tav. LVII(b) and LVIII(a).
- <sup>86</sup> Hayes 1972, 329-338, fig. 67-69.
- <sup>87</sup> Martin 1998.



- <sup>88</sup> Hayes 1972, 310-315. Atlante 1981, 184-207.
- <sup>89</sup> Ennabli 1976, 256.
- <sup>90</sup> Typology and discussion of late Roman amphorae: Riley 1979. *Spathaia* and 'cylindrical' amphorae: Joncheray 1975; Keay 1984; Monsieur 1991; Mercado 1979, fig. 10c and g, fig. 14a and fig. 15 (Cone di Arcevia), fig. 120q and fig. 182 (*Potentia*). Late Roman 1: Empereur/Picon 1989, 236-243. Late Roman 5/6: Empereur/Picon 1989, 243; Robinson 1959, 68, n° K108, pl. 15: Athenian agora context middle 3<sup>rd</sup> century AD, probably the earliest dated Late Roman 5/6.
- <sup>91</sup> The hexagonal tiles where found in the eastern part of the intra-site survey.
- <sup>92</sup> Marche: *Potentia*: Mercado 1979, 266, 267, fig. 178c. Cone di Arcevia: Mercado 1979, 94, fig. 5. Castelfidardo: Mercado 1979, 136, fig. 49; Mercado 1981; Quiri 1985; Mercado 1989. Emilia-Romagna: Scagliarini 1989, 14, fig. 11, 12. Veneto: Dall'Aglio/De Maria 1988, 141.
- <sup>93</sup> Dall'Aglio/De Maria 1988, 143, fig. 29, 5 and 7.
- <sup>94</sup> The *tesserae* where spotted at the northern and southern areas of *Potentia*.
- <sup>95</sup> This piece of mosaic was found in the northern area of *Potentia*.
- <sup>96</sup> Mercado 1979, 191, fig. 109.
- <sup>97</sup> Percossi Serenelli 2001, 30, fig. 5.
- <sup>98</sup> The stucco was mainly found in the northern and eastern areas of *Potentia*.
- <sup>99</sup> Pelliconi 1983, 226-229, n° 22.12-13 and n° 22.16; Fortini 1984, 110, 121-125, n° 11, fig. 3, 11-12; Matijasic 1983. Necropolis of La Pineta: Mercado 1974b, tomb 85, fig. 335h and 341.
- <sup>100</sup> Forms 50 and 51: Isings 1957, 63-69. *Unguentaria*: Mercado 1974a, passim; Percossi Serenelli 2001b, 160-161, fig. 78-80. 'Millefiori': Painter 1988, 51, n°27, cf. Isings 1957, 17-21.
- <sup>101</sup> Mercado 1979, 267, fig. 164 and 178.
- <sup>102</sup> Hardware: Intel Pentium 4: 2.4 GHz; 512 RAM; 75 GB hard disk; 1.44 MB floppy drive; Samsung CD-R/RW 48x/16x/48x, several printers. Software: Microsoft Windows XP; Microsoft Office XP; ESRI ArcView 3.2 + 3D Analyst & Spatial Analyst; Airphoto 2.20; Minitab 13; Adobe Photoshop 7.0. It is also worth underlining that, besides this central PC, every member of the PVS-team has his/her own PC, sometimes with some important peripheral instruments: digitizer tablet CalComp 9500; A3-scanner: EPSON 1640 XL; slide scanner Canoscan 2700F.
- <sup>103</sup> Voorrips 1998, 255.
- <sup>104</sup> Federal Geographic Data Committee 1998.
- <sup>105</sup> <http://www.csc.noaa.gov/metadata/text/download.html>
- <sup>106</sup> Heuvelink 1993, 23-25.
- <sup>107</sup> Hageman/Bennett 2000, 114-115.
- <sup>108</sup> This is a vector-based structure, composed of a set of triangular facets.
- <sup>109</sup> Exponential, Circular, Spherical, Gaussian and Linear Ordinary Kriging; Universal Kriging - with linear and quadratic drift; Spline; Inverse Distance Weighting; Trend and TIN.
- <sup>110</sup> A detailed report of all analyses, including the computation of the DEM, can be read in Verhoeven 2002.
- <sup>111</sup> Off-site 0: 0 artefacts /50m; 1: <=5 artefacts/50m; 2: <15 artefacts/50m and off-site 3: >=15 artefacts/50m.
- <sup>112</sup> Fisher 1999, 8.
- <sup>113</sup> Hodder/Orton 1976, 226-229.
- <sup>114</sup> To execute this, Airphoto 2.20 is used. Designed by Irwin Scollar, this software is specifically developed to rectify archaeological images made with handheld uncalibrated cameras (Scollar 2002, 167).
- <sup>115</sup> See contribution by Vermeulen and Boullart.

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# The Astura project, interim report of the 2001 and 2002 campaigns of the Groningen Institute of Archaeology along the coast between Nettuno and Torre Astura (Lazio, Italy)

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## Abstract

This article reports on recent fieldwork carried out in three campaigns between 2000 and 2002 by the Groningen Institute of Archaeology on the coast between present-day Nettuno and Torre Astura in South Lazio (Italy). The focus is on the excavation of a late Bronze Age site with evidence for salt production, the investigation of a ca. 120 m long section eroded by the sea that contains evidence for the production of amphorae in the Roman Republican period, and the excavation of a lime kiln of subrecent date.

## OUTLINE

Following a preliminary campaign in the summer of 2000, the Groningen Institute of Archaeology (GIA) programmed archaeological fieldwork in the summers of 2001 and 2002 on various sites along the coast between Nettuno and Torre Astura (south Lazio, Italy; fig. 1). A concise overview of occupation history and useful historical maps of this area can be found in the introduction to the *Forma Italiae* volume Astura (Piccarreta 1977, 7-19). Piccarreta points out that earlier topographical research focussed on the coastal strip between Nettuno and Astura and especially on Torre Astura as the possible location of the villa of Cicero. Lanciani reports various locations of archaeological interest along the coast, among which the villa at Le Grottacce (Piccarreta 1977, fig 4). Short notes on our campaigns appeared in Dutch (Attema *et al.* 2001b and Attema *et al.* 2002), while a paper in Italian is forthcoming (Attema/Nijboer forthcoming). Post-excavation work was carried out during the 2001 campaign and in the first three weeks of the 2002 campaign, in advance of further excavation work in the coastal zone. Following a brief introduction on the location and geology of the fieldwork area and the history of research, this paper discusses four fieldwork projects carried out by GIA (fig. 2 for location).

1 The excavation of the late Bronze Age site P 13 (§2.1-2.6). The excavation of site P 13 revealed

partially *in situ* strata containing concentrations of burnt tuff chunks and numerous shards of large impasto containers made of red clay. These strata did not contain any features and are therefore probably dump layers. We link these deposits to production activities relating to the preparation of salt. In places, the protohistorical strata are disturbed by Roman activities

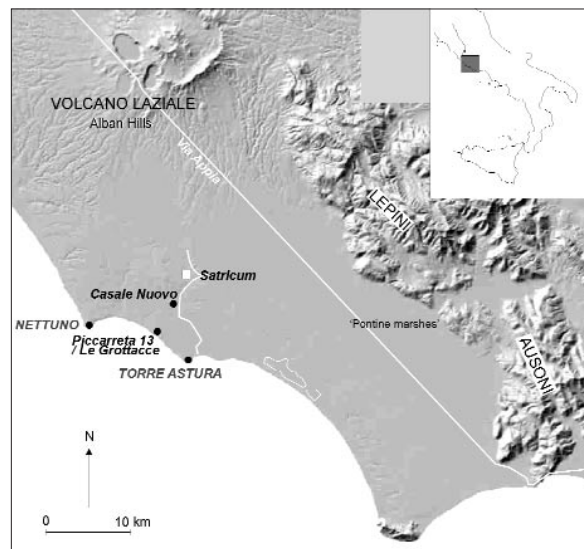


Fig. 1. Location of the fieldwork area within the Pontine Region on a shaded digital elevation model (inset: location of the Pontine Region within Italy).



ing protohistoric shards was recorded. This stratum, dating to the late Bronze Age/early Iron Age, was excavated. Finally, several dumps of amphorae, described by us as 'amphora pockets', were excavated between Le Grottacce and P 13 in the 2002 campaign. The significance of the amphora section at Le Grottacce, and of the 'amphora pockets', is twofold. Firstly they provide evidence for the production of amphorae along the South Latial coast, showing how the local late Republican elite were involved in commercial activities. Secondly it adds to our understanding of the regional development of Roman Republican rural infill in the landscape unit of the beach ridges, as first recorded in our Fogliano survey (Attema *et al.* 2001a).

- 4 The excavation of a kiln site constructed in a slope of tuff near the military observatory 'Bottego' (§5). The upper fill of the kiln, recorded in Piccarreta 1977 as P 11, showed its re-use as an observation post by an American soldier involved in the landing of Anzio during the Second World War. This stratum contained munitions, tin cans and other personal belongings. The remainder of the kiln was filled with dune sand with hardly any stratification. A stratum of lime, glazing and charcoal characterized the bottom of the kiln, just above which some Roman shards were collected. This stratum indicates that the kiln had been used for the production of lime. The dating of the kiln is problematic; its structure resembles that of a Roman lime kiln such as the one described by Cato in the 2<sup>nd</sup> century BC (Adam 1994, 70). Methods of lime production, however, have barely changed in pre-industrial settings since antiquity. The Roman shards found inside the structure may have fallen in secondarily since numerous Roman shards were recovered in the vicinity of the kiln. A sample for <sup>14</sup>C dating taken from the lowest level of the fill dates the kiln to 1480-1960 AD (95.4% probability calibration (Oxcal v.3.5) of GrN-27342, 240±50 BP), but no subrecent material was recovered in the vicinity of the kiln.

Although post-excavation work on the ceramic repertoire of these sites is still underway, we can present here the main types and fabrics from P 13 and the Le Grottacce section. The final publication, including a full pottery catalogue, will be published elsewhere.<sup>1</sup> The final post-excavation work, an exhibition and preparation of the final publication are planned for the summer campaign of 2003.

## 1 INTRODUCTION

### § 1.1 Location and geology

The archaeological sites reported on in this paper are all situated in the zone of the younger dunes on the south Lazio coast between Nettuno and Torre Astura (*figs. 1, 2*). They all lie in the so-called Poligono Militare, an extensive military base that is closed to the general public and which preserves the natural coastal landscape of the Agro Pontino in a unique way. Marine erosion has exposed a series of Pleistocene deposits that are of importance for the reconstruction of the recent geology of the Pontine region and were first described by Blanc (1935). The stratigraphical sequence visible along the coast to the south of the villa complex of Le Grottacce is characterized by red sands resting on lithoid tuffs, which in turn were deposited on marine sediments. These red sands (*sabbie rosse*) are the residue of a series of palaeodunes of aeolian origin and are remains of the ancient coastal landscape during the Upper Pleistocene at a point in time when the sea level was substantially lower and the climate much colder than it is now (post-Tyrrhenian marine regression phase, Wurm glacial period). The strongly coloured red sands rest on a formation of lithoid tuffs formed during the Middle Pleistocene out of pyroclastic flows ejected by the Volcano Laziale. These tuffs include marine fossils and fossilized wood (*Quercus*, *Tilia*) and rest in turn on bluish marine loamy sediments (*marne azzurre*) (Blanc 1935; 1936). The latter were formed in the Lower Pleistocene (Sicilian?) and contain many fossils, above all of molluscs. Of these the *Arctica islandica*, a bivalve, is particularly important, as it is an indicator for the palaeoenvironment and represents the oldest phases of expansion of the quaternary glacial period in the Mediterranean. Today this species is present in the northern Atlantic.

The morphological genesis of the wider area was discussed extensively by Sevink, who discerned four consecutive marine terraces of which the youngest, on which the sites reported here are located, is referred to as the Terracina level (Sevink *et al.* 1984). Although fertile aeolian areas can be found more inland on the ancient beach ridges, the soils directly bordering on the coast consist of windblown dune sands only. It is thought that the present coastline has receded with respect to the Bronze Age coastline due to various interlinked processes, which we will not go into here (Leoni/Dai Pra 1977; pers. comm. A.



Arnoldus-Huyzendveld). Nowadays, marine erosion is increasing due to infrastructural projects (cf. Alessandri 2000-2001, tav. 10 fig. 3).

### § 1.2 Preliminary work in 2000

A pilot study was carried out in the immediate vicinity of the large Roman villa of Le Grottacce in the summer of 2000 (Attema *et al.* 2001b), where the sea had over the years exposed archaeological remains ranging from the Palaeolithic to the Roman Imperial period. During the brief campaign a preliminary study of amphora material collected from the Le Grottacce section was carried out, and a first study was made of the remains of kilns that it contains. The strata with amphora shards, as well as the kiln remains, had previously been described by Piccarreta (1977) as part of his description of the 'villa costiere' of Le Grottacce, and appear in his publication under entry nr. 15c (indicated as nr. 3 on the location map in *fig. 2*). We also evaluated the protohistorical remains located about 400 m to the south of Le Grottacce, which were described in Piccarreta's publication under nr. 13 (indicated as nr. 1 on the

location map in *fig. 2*). Both areas were deemed of such great importance for our understanding of the regional settlement pattern and economic system that a permit was sought from the Soprintendenza per il Lazio to record and sample the amphora section and to excavate the proto-historical site. The permit was given in the spring of 2001 by the Ministero per i Beni Culturali and the Soprintendenza per il Lazio. Special permits, generously provided by the Ministero della Difesa, made it possible to carry out fieldwork on the military base. The staff of the Poligono Militare imposed safety procedures during actual fieldwork because the area had been the scene of the landing of the allied forces at Anzio during WW II, and not all of it has been cleared yet. Presently, experiments with military weaponry constitute the main activity at the base. Military personnel checked the surfaces to be excavated with metal detectors and any metal objects of recent date were removed. Permission was also obtained for the excavation of a kiln structure near the military observatory 'Bottego' (appearing on Piccarreta's map as nr. 11; indicated as nr. 4 on the location map of *fig. 2*). During the 2000 campaign only

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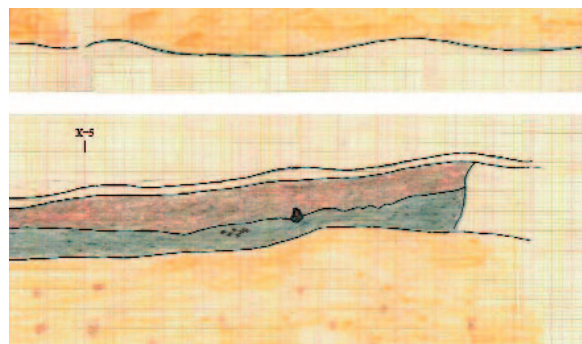


Fig. 3a. Site P 13 before excavation from south-east.

Fig. 3b. Site P 13 before excavation from south-west.

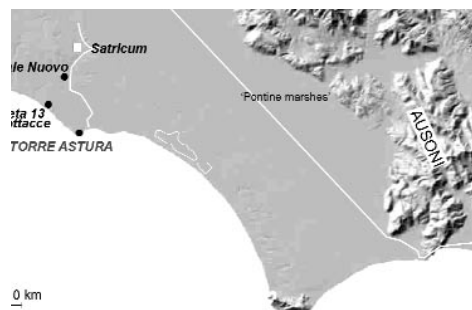


Fig. 3c. Site P 13 during excavation.

Fig. 3d. Overview of site P 13 during excavation.

preparatory cleaning had been done, and excavation was begun in 2001. In 2002 the permit was extended to allow the recording and sampling of several other exposures and sites along the coast, including one located on the beach at Nettuno Depuratore, an exposure near the Carnevale valley and two small sites near Bottego (indicated as nr. 2a, 2b and 2c respectively on the location map of fig. 2). In the following, our work at the protohistorical site Piccarreta 13, various sections along the coast, the amphora section (Piccarreta 15c) and amphora pockets and the Bottego kiln site (Piccarreta 11) is reported.

## 2 THE LATE BRONZE AGE SITE P 13

### § 2.1 Introduction

#### Notes on its location

P 13, a protohistorical site also described by Alessandri, where it is referred to with the toponym Pellicione (Alessandri 2000-2001 site 18), is located on a sandy body consisting of, in the lower part, sabbie rosse containing Palaeolithic artefacts, on top of which appear younger sands. The sandy body is being eroded on three sides, resulting in a small 'promontory' revealing strata with both protohistorical and Roman material (figs. 3, 4). Directly to the north, silty clayey layers have been deposited by a former stream. The strata with shards merge into this layer. To the south the strata with shards merge into the sandy cliff that runs southward along the coast. The inclination of the strata excavated on P 13 indicates that the area under excavation probably constitutes only the northern sloping part of a much larger site which lay along the stream and is now largely eroded by the sea. The hypothesis that the area north of the site bordered on a small valley is also supported by the presence of amphora pockets and tuff stones (remains of walls?) on a much lower level than that of the protohistorical strata. Both Piccarreta's observations and our own indicate that all of the area including the valley was intensively exploited in Roman times.

Piccarreta's description of the protohistorical stratum of P 13

Piccarreta describes this site in his 1977 publication as large and with high concentrations of shards. At the time, marine erosion had already exposed the stratum containing ceramic fragments along

*Fig. 4. Detail of stratigraphy south main section promontory showing protohistorical layers.*

a length of about 200 m and the site stretched land inwards to a distance of about 50 m. The stratum had a thickness of 60 cm, the entire section a height of 2.5 m (Piccarreta 1977, 76). The vessels were described as having been made of brown impasto and belonging mostly to large *dolii* and *olle* with notched cord decorations; no thin impasto was present. Regarding the date of the ceramics, Piccarreta mentions that although the shards are not precisely datable, the finds in general can be attributed to the early Iron Age (*prima età del ferro*). He interprets site 13 as a permanent settlement.

#### Method and aims of the excavation

Work on the site was begun in 2001, with the cleaning and drawing of the sections exposed by the sea. On the site itself a grid was laid out and five trenches (A to E) were set out, the objective being to relate the strata visible in the section to any features in the subsoil of the site and to interpret and date these. During the 2002 campaign

three more trenches were added (F to H). Figure 6 shows in schematic outline the main strata present at P 13, while figure 7 shows the plan of the site with the location of trenches A to H. While the 2001 excavation was done by hand, in the campaign of 2002 the top layers of the trenches were removed by a dragline. In general trenches were excavated in spits of about 5 cm thickness, but where appropriate the archaeological stratigraphy was followed in order to be able to relate shards to specific contexts.

Study of the finds from the various strata showed that layers with mixed finds of protohistorical and Roman pottery occur in all trenches. Table 1 gives an overview of the ratio of protohistorical and Roman shards in the excavated trenches. Trench C had the highest number of Roman pottery by far, contained in a humid black sandy soil, indicating that the protohistorical context was locally disturbed. The excavation strategy of the 2002 campaign was therefore aimed at isolating undisturbed protohistorical deposits and features. In what follows, the strata recorded in the main section and in the various trenches are discussed and brought in relation to each other.

## § 2.2 Report on the 2001 and 2002 campaigns

Finds from the Palaeolithic in the red sands of P 13

In the course of the 2002 campaign a trench was excavated in the red sands at the foot of the P 13 promontory. Our observations confirmed the

presence and stratigraphical position of lithic industry of the Middle Palaeolithic (already noted by Blanc in the 1930's). The artefacts can be attributed to a facies of the Mousterian known as the 'Pontinian', characteristic of the south coast of Lazio (Blanc 1937). The archaeological material collected consists of 46 artefacts all struck from small flint pebbles (*fig. 5*), and can be subdivided as follows:

- \* Cores. There are 13 cores, three of which have a (unidirectional) striking platform (*fig. 5 nr. 1*), one is a centripetal core (*fig. 5 nr. 2*), another is a core of the 'chopping tool' type, and four are pebbles that show only one or two negative scars (flaked pebbles). The maximum length of the cores ranges between 46 and 24 mm.
- \* Flakes. There are 23 of these, among which 11 cortical flakes of which the cortex covers all of the dorsal part; two flakes show a dihedral butt. The maximum length of the flakes ranges between 45 and 18 mm.
- \* Debris. A total of 5.
- \* Tools. There are 5 retouched flakes (*fig. 5 nr. 3*), one denticulated and one notched piece (*fig. 5 nr. 4*).

Notwithstanding the small number of lithic pieces recovered, the sample assumes a certain importance not only because it is part of a homogeneous industrial complex but also because it comes from a specific stratigraphical context within the red sands. It should be noted that not a single lithic artefact dating to the Upper Palaeolithic had previously been recovered from

TRENCHES						
trench	m3 soil	N total	N/m3	N Roman pottery	N impasto	% Roman pottery
A	2.5	2218	887	24	2194	1
B	4.5	2445	543	25	2420	1
C	3.1	5414	1746	807	4607	15
D	1.7	10597	6234	48	10549	0
D1	0.4	203	508	6	197	3
E	3.3	3146	953	26	3120	1
F	1.4	5186	3704	43	5143	1
G	3.3	11179	3388	84	11095	1
H	2.9	3980	1372	27	3953	1
stray	-	654	-	3	651	0
<b>Totals/mean</b>	23.1	45022	1949	1093	43929	2.4

Table 1. Ratio of protohistorical impasto and Roman potshards in trenches A-H from the 2001 and 2002 campaigns.

the red sands, while epigravettian industry is abundantly present in the yellow sands directly above (Ansuini/La Rosa 1989).

#### The stratigraphy of P 13

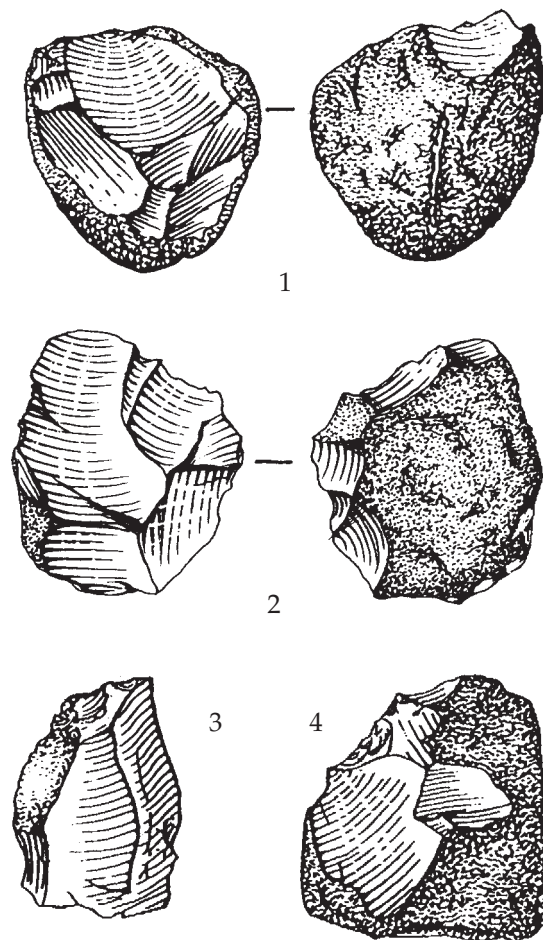
Of the layers that were distinguished in the main section of P 13, we highlight four that are the most relevant for the interpretation of the site. Apart from the top soil of recently deposited dune sand, we will discuss the following layers in stratigraphical order (*fig. 6*): *layer 1*, a light brown sandy soil with mixed worn Roman and protohistorical finds; *layer 2*, a grey and compact sandy-clayey soil (Munsell colour 2.5Y 2.5/1 black), also containing Roman and protohistorical pottery but in a less worn state; *layer 3*, a grey and compact sandy soil (5Y 6/1 grey) with concentrations of protohistorical shards and tuff chunks; *layer 4*, a transitional layer of grey sandy soil between layers 2 or 3 and natural sands.

*South part of main section and trench A (fig. 6, 7, 8a; table 1)*

In the south part of the main section, two layers with ceramics and chunks of tuff could be distinguished below the sandy top soil: a (light) brown layer (1) and a darkish grey layer (2/3). The brown layer appeared immediately below the top soil in trench A, and was excavated in four spits. Up to spit 3 it contained mainly protohistorical impasto, but a few Roman amphora shards were present as well. Spit 3, for instance, contained a fragment of a jug or small jar of depurated clay (Roman or somewhat earlier) among the protohistorical impasto. There is a minor colour variation, tending towards grey in the deepest spit, but on the whole the brown layer can be considered a mixed layer that is well separated from the grey layer below. The latter was described as firm grey soil with, in spit 5, both tuff chunks and protohistorical impasto. The lowest spit 6, however, still contained a fragment of Roman pottery. Identification of this layer as either 2 or 3 was not possible; hence the layer is referred to as 2/3 in the drawing. Trench A was not continued in the 2002 campaign.

*South part of main section and trench B (fig. 6, 7, 8b; table 1)*

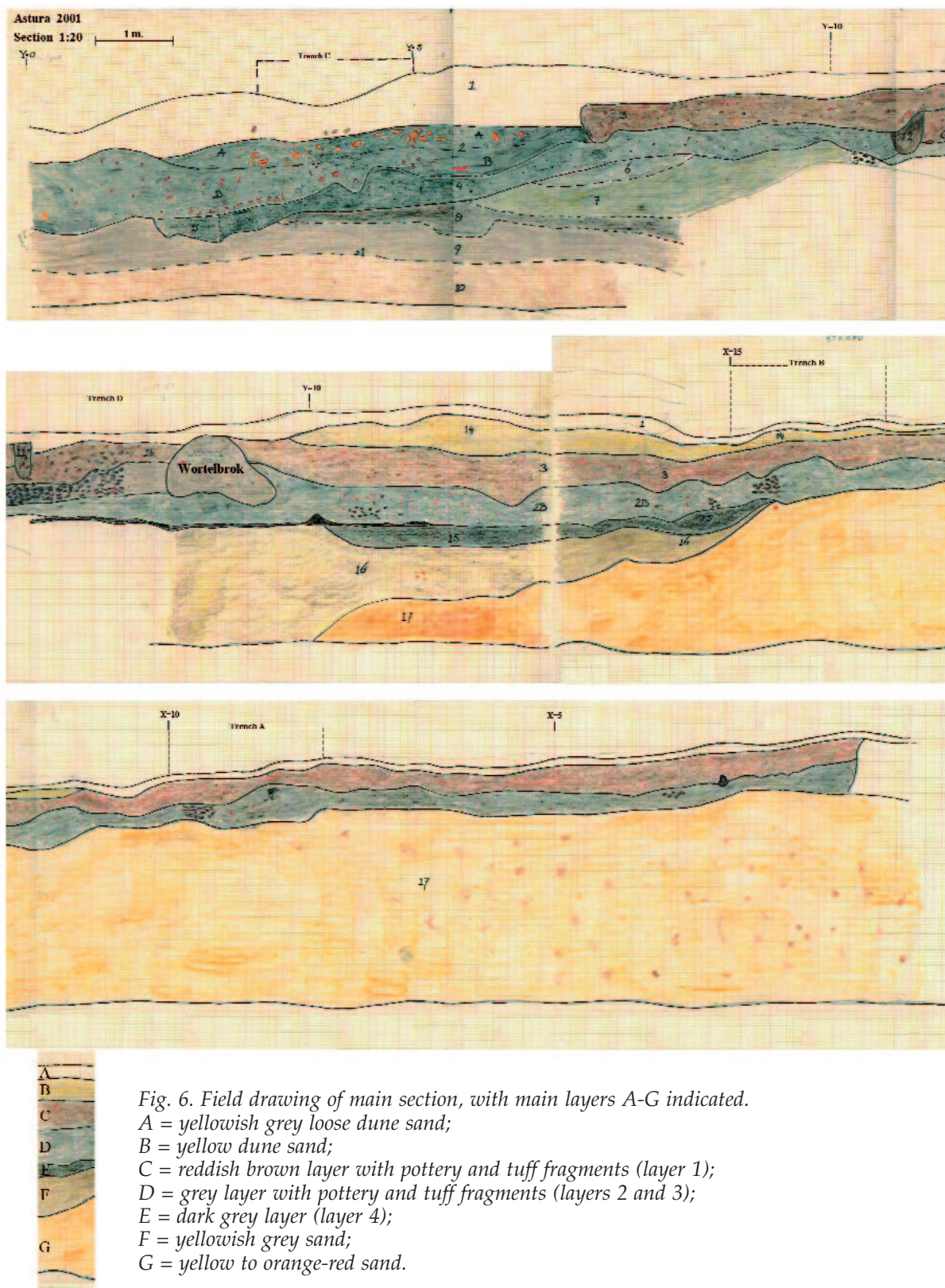
In trench B as well the brown layer (1) of the main section is clearly separated from a darkish grey layer below it (2/3). As in trench A the brown layer contained Roman shards down to the lowest spit, again in very low numbers. Even among the finds from the spits in the darkish grey layers



*Fig. 5. Lithic artefacts, drawings G. Lalli.*

of trench B sporadic Roman shards occurred. In spit 8, for instance, 1111 protohistorical shards were found, plus one Roman shard. In this spit the darkish grey layer is homogeneous as regards soil texture, impasto material and its association with the often burnt chunks of tuff. It contained mainly burnished fragments of large containers, although a fragment of a burnished cup (*tazza*) was also found. This spit may be considered to be part of an undisturbed protohistorical stratum (layer 3) with only one later intrusion. In the eastern part of trench B variations were noticed in the grey layer in spits 10 (very dark soil) and 11 (olive brown soil). Of the transitional layer 4 only a very small part was excavated in trench B during the 2001 campaign. It is described as a very dark grey, loose powdery soil that hardly contained any shard material. It lies on top of the sterile sand body. Trench B was not continued in the 2002 campaign.





*Main section of Promontory and trench D (fig. 6, 7, 9; table 1)*

The promontory section below the top soil consists of the continuation of the brown layer (1) and the grey layer (2/3). It is disturbed by the trunk and roots of a tree. At different stratigraphic positions, pocket-like features appear containing darkish brown soil (with and without potshards). To the north of the tree trunk a very dense concentration of impasto shards became visible in layer 2/3. On excavation of trench D it appeared that both layer 1 and 2/3 contained sporadic Roman shards among huge amounts of protohistorical pottery piled one on top of the other (fig. 9). At the end of the campaign of 2001 this pile of shards was almost completely removed. The trench yielded 10,549 impasto pottery shards and 48 Roman shards (less than 0.5 %) in a very small area of about 3 m<sup>2</sup> and having an average thickness of 0.5 m. The shards belong almost exclusively to large containers.

On the south side of trench D a lump of darkish soil (referred to as D1) had in the recent past detached from the promontory. It contained a rim *a cordone* of a large storage jar (situla type) and a smaller jar with a lug. The *a cordone* rim was found upside down in the soil (fig. 10). Trench D was not continued in the 2002 campaign.

*Northwest part of main section and trench C (fig. 6, 7, 8c; table 1)*

The stratigraphy in the northwest part of the main section showed, below a thick cover of sandy topsoil, the continuation of the grey layers (2 and 3). These correspond to layers defined in the north and east sections of trench C, with minor colour variations becoming gradually darker towards the bottom. Spits 4 to 7 contain the highest concentration of Roman shards (781 versus 2736 impasto shards) and can be positively identified as layer 2. The fragments of Roman pottery in this layer are larger than those recovered in other trenches, and appear in random orientations in the soil (upright, oblique, on their backs, etc.). Lower down the percentage of Roman shards diminishes greatly (850 impasto shards: 3 Roman potshards). This layer, which also has slightly different soil characteristics, is cautiously interpreted as layer 3. The darkish sand layers below 2 and 3 are considered to be transitional layers, of which one is characterized by carbon speckles and the lowest by flecks of pottery. Trench C was not continued in the 2002 campaign.

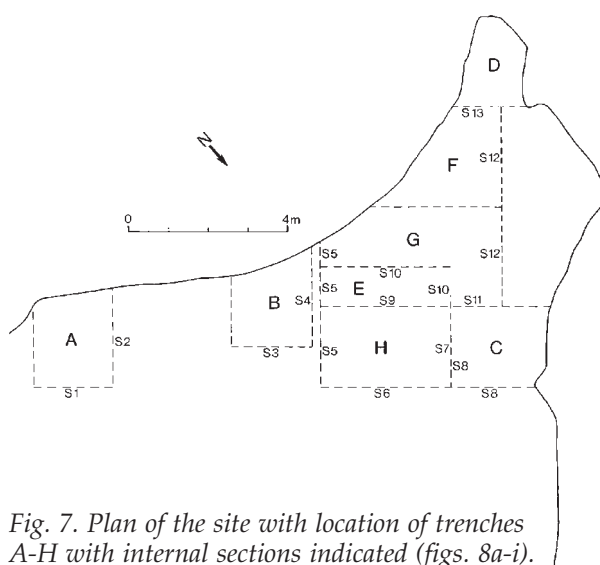


Fig. 7. Plan of the site with location of trenches A-H with internal sections indicated (figs. 8a-i).

*Trench E (fig. 7, 8d, 8h; table 1)*

A connecting trench (E) was dug between trenches B and C in order to find the limits of the amphora concentration in layer 2 as encountered in trench C (fig. 7 for location). After removal of the topsoil, the brown layer (1) was excavated. Towards the west, this layer gradually became darker, grading into layers 2/3 in the main section. Below it in a large part of trench E the undisturbed protohistorical layer 3 was found. In the eastern part (as in spit 8 of layer 3 in trench B), it was characterized by a thick deposit of protohistorical impasto associated with burnt tuff chunks. In the 2002 campaign, trench E was excavated down to the sterile soil. Trench E confirmed that layer 2 overlies layer 3.

*Trench F (fig. 7, 8e, 8g; table 1)*

Trench F was opened in the 2002 campaign to connect trenches D and E (excavated in 2001). The top layers were removed mechanically. In the first four spits the mixed layer 1, brown gritty soil with protohistorical and Roman shards, was removed. Spit 5 then revealed both layer 3 (in a small area in the east part of the trench) and layer 2 (in the south part of the trench). The top surface of spit 7 showed contact between layers 2 and 3, whilst in spit 8 all of trench F showed either layer 2 or 3 without intrusions from the upper layers. In spit 10, layer 2 was removed in the eastern part of the trench and layer 3 was uncovered. Layer 2 is therefore positioned on top of layer 3, the lowest archaeological layer. Trench F thus corroborates the evidence from trench E that layer 2 overlies layer 3.

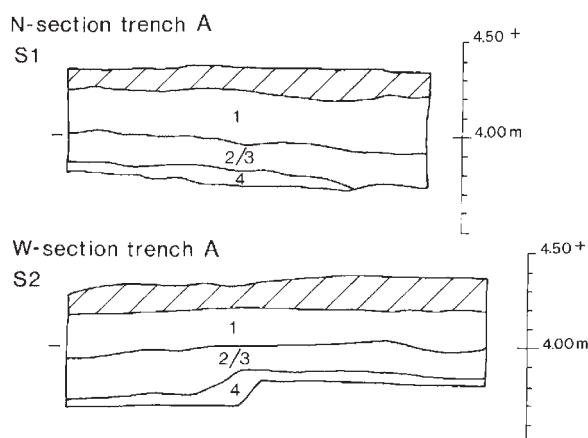


Fig. 8a. Sections trench A.

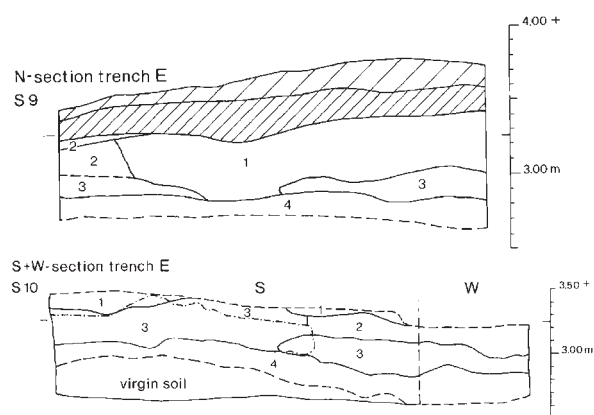


Fig. 8d. Sections trench E.

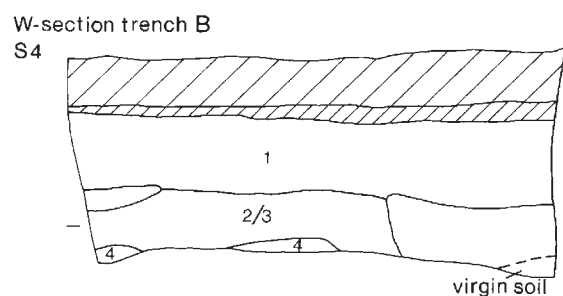


Fig. 8b. Sections trench B.

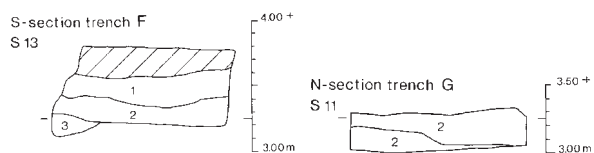


Fig. 8e. Section trench F. Fig. 8f. Section trench G.

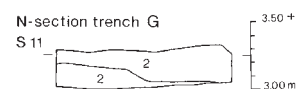


Fig. 8g. Combined section trench F and G.

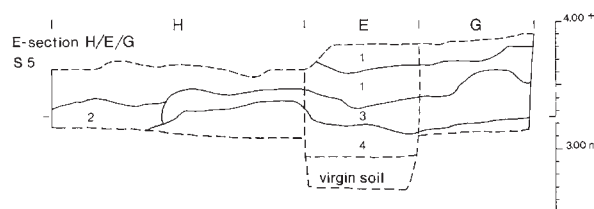


Fig. 8h. Combined section trench H, E and G.

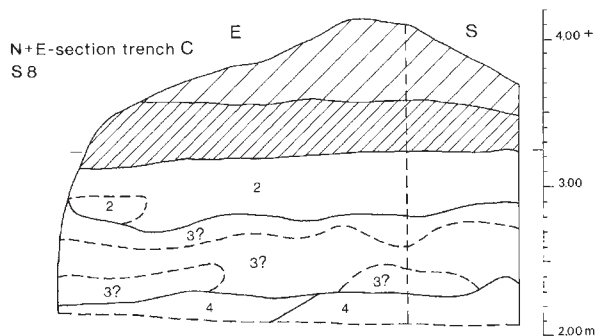


Fig. 8c. Sections trench C.

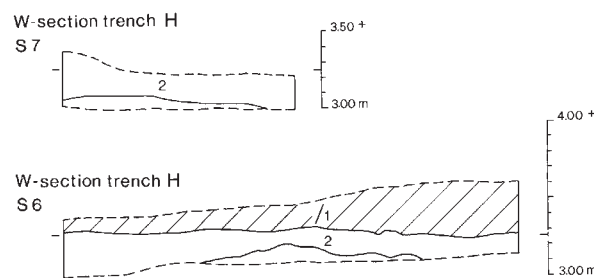


Fig. 8i. Sections trench H.



*Trench G (fig. 7, 8f, 8g, 8h; table 1)*

In trench G, layers 2 and 3 became visible immediately after the first spit containing the mixed layer of brown soil (1) had been removed. In spit 4 the dense concentration of shards, characteristic of layer 3 as seen in the south part of the main section, was laid bare. Besides the many often quite large shards, a large concentration of tuff chunks was found, some of which had flat, and apparently worked, surfaces. The majority of these show traces of contact with fire on one or more sides. No clear structure emerged when the cleaning of the tuff and shard concentration was complete. In between the mix of shards and tuff chunks some lumps of (fired) clay were found, yellowish brown in colour. The stratigraphy of trench G again shows that layer 2 overlies layer 3. Various samples for 14C dating were taken from layer 3.

*Trench H (fig. 7, 8h, 8i; table 1)*

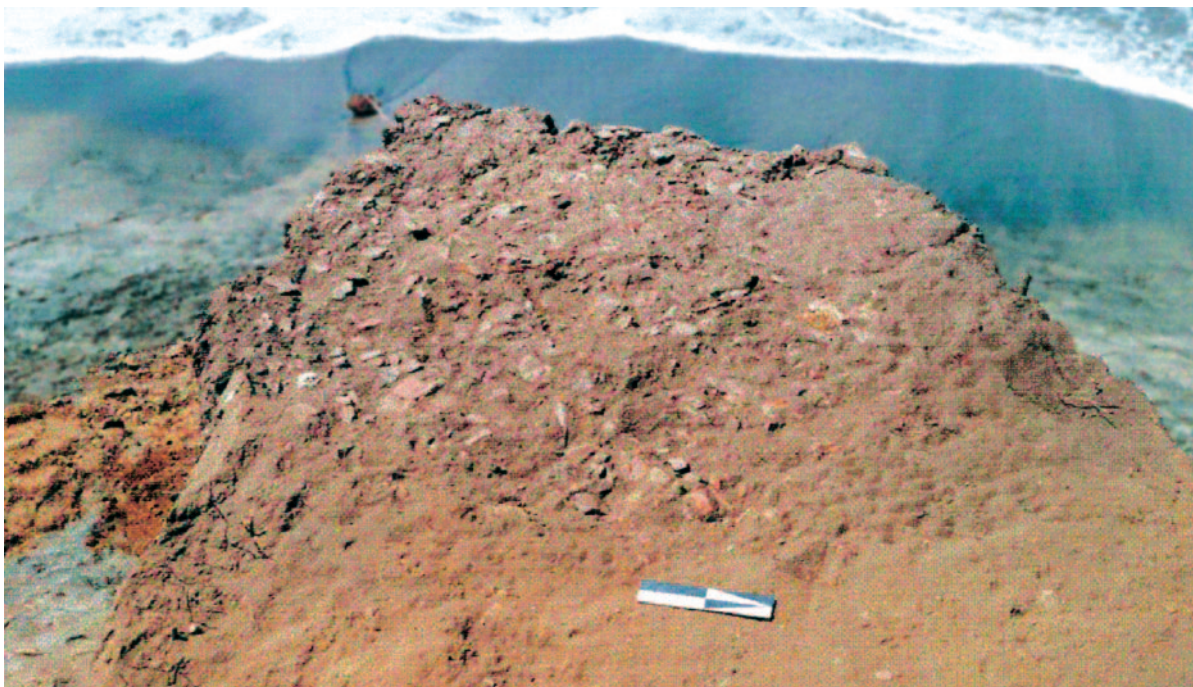
The furthest extent of layer 2 was found in trench H. In the first four spits, the mixed layer of brown soil (layer 1) was removed to reveal the grey layers 2 and 3. The excavators noted how shards had washed out of layer 3 into various layers of later date. This phenomenon has also been observed in the south and north sections of trench E as a thin continuous layer of small impasto shards merging from layer 3 into layer 2. In trench H the

stratigraphical relation between layers 3 and 2 became clear in spit 6; again, the latter overlies the former. The sections of trench H show that layer 3, and the shard concentration it contains, gently slope down towards the west and north.

*§ 2.3 Summary finds report*

From the excavation, a total of 45.022 shards were recovered of which 97.6% was generically proto-historical and 2.4% of Roman date. At the time of writing of this report the finds of both the 2001 and 2002 campaigns were processed quantitatively, but only those of the 2001 campaign were looked at in detail, refitted where possible, drawn and described. Therefore only a preliminary typology is presented of the types that occur at P 13.

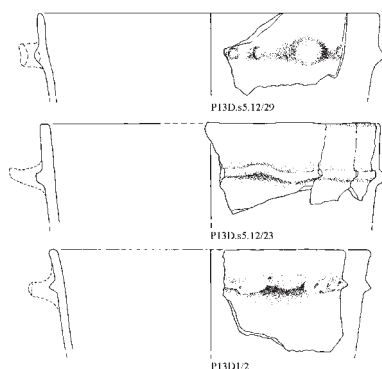
The typology of the ceramics excavated at P 13 and from the protohistoric levels at P 15c presented below was established during the 2001 campaign (fig. 10). In the classification a basic distinction is made between open and closed vessels. An open vessel has its maximum diameter at the lip. A closed vessel has its maximum diameter somewhere between the rim and base. Diagnostic forms concern rims, bases, cord decorations, lugs and handles. The typology lists the following aspects: Class, Type, and Date.



*Fig. 9. Photograph of pit D shard concentration in layer 2/3.*

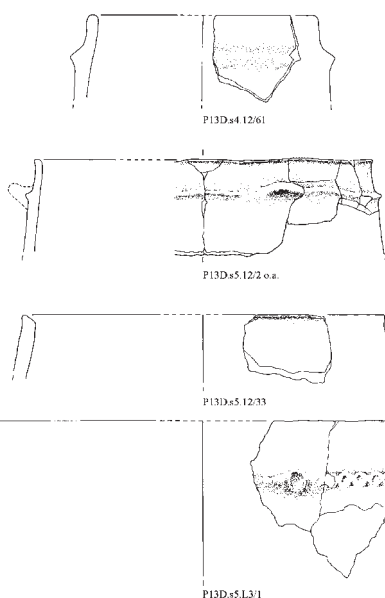


Class I STORAGE JARS  
Diameter lip is larger than 30 cm.



Type I.1: troncoconical storage jar with straight, vertical rim often with plain or notched cord and lugs at transition rim to shoulder. Varieties of lips: convex, flattened, bevelled on the outside, pointed or (slightly) thickening on the outside. Open vessel.

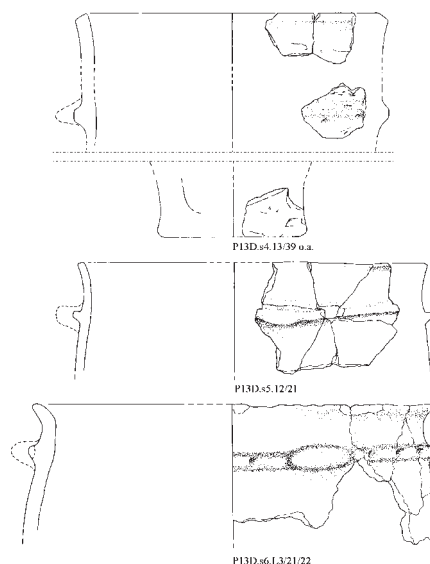
LBA-EIA



Type I.3: cylindro-ovoidal body with slightly incurved shoulder/rim with often plain or notched cord and lugs at transition shoulder to rim. Varieties of lips: convex, pointed, bevelled on the inside or flattened. Closed vessel.

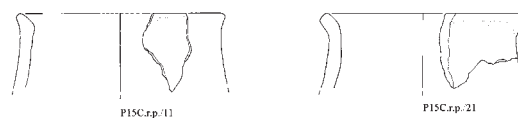
Transition from type 1 to 3 is gradual in repertoire due to some rims, which are only slightly incurving. Some rim fragments are too small to establish their typology.

LBA-EIA



Type I.2: probably cylindro-ovoidal body with (slightly) outcurved rim and on the inside a smooth transition from shoulder to rim. Often with plain or notched cord and lugs at transition shoulder to rim. Varieties of lips: convex or flattened. Closed vessel.

LBA-EIA



Type I.4: probably cylindro-ovoidal body with outturning rim (sometimes outcurved) with angular transition rim to shoulder. Varieties of lips: convex, pointed flattened. Closed vessel.

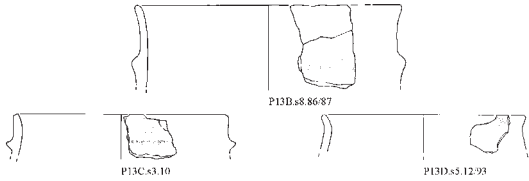
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Fig. 10. Typology, classes I-V on pages 118, 119 and 120 (upper left column).

## Class II JARS

Diameter is smaller than 30 cm.

Most of the jar types are smaller versions of the storage jar types I.2, I.3, I.4.



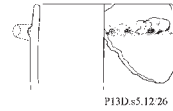
Type II.1: probably cylindro-ovoidal body with (slightly) outcurved rim and on the inside a smooth transition from shoulder to rim. Often with plain cord at transition shoulder to rim. Varieties of lips: convex or flattened. Closed vessel.

LBA-EIA

Type II.3: probably cylindro-ovoidal body with outturning rim with convex transition rim to shoulder. Convex lip. Closed vessel.

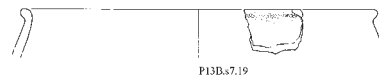
LBA-EIA

No illustration.



Type II.2: cylindro-ovoidal body with slightly incurved shoulder/rim with notched cord and lug at transition shoulder to rim. Convex or flattened lip. Closed vessel.

LBA-EIA

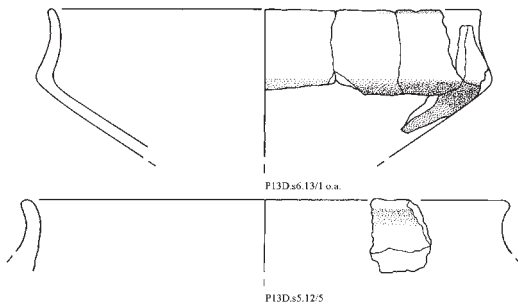


Type II.4: probably ovoid/globular body with outcurving/outturning rim and convex lip, thickening on the outside, partly undercut. Closed vessel.

LBA-EIA

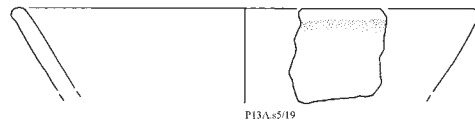
## Class III BOWLS

Diameter on average 15 to 20 cm.



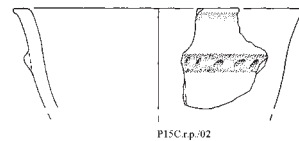
Type III.1: Carenated bowl. Low conical body, smoothly curved carena, short steep shoulder, slightly outcurving rim with convex lip occasionally thickening on the outside. Open vessel.

LBA



Type III.2: Oblique or spreading wall/rim, largest diameter at the rim. Varieties of lips: convex, flattened or thickening on the outside. Possibly bowl/lid

LBA



Type III.4: Flaring wall, slightly curved or straight rim. Varieties of lips: flattened, thickening on the outside or convex. Open vessel.

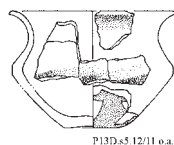
## Class IV LARGE BOWLS

Diameter is larger than 30 cm.



Type IV.1: Wide rounded body, straight vertical rim, sharp internal angle on transition shoulder to rim.

Class V CUPS  
Diameter between 10 and 20 cm.



Type V.1: Deep conical body, smoothly incurved shoulder, outcurving rim, convex lip, decorated with horizontal band with oblique ridges along widest part of the body. Closed vessel.

LBA



Type V.2: Convex shoulder, short conical neck with outturning rim and convex lip. Angular transition neck to shoulder on in- and outside (a collo distinto). Closed vessel.

LBA-EIA

The majority of the excavated shards belong to storage jars, which are difficult to date with precision because they are of generic type (cf. the (storage) jars in: Alessandri 2000-2001; Mandolesi 1999, 174; Cassano *et al.* 1978; Damiani *et al.* 1998, Tomb 2). In general the excavated storage jars can be dated to the Late Bronze Age as well as the Early Iron Age. Most of them are coarsely made, which accounts for the varieties of lips within the types. The majority of the jar types are smaller versions of the storage jar types I.2, I.3 and I.4, and hence cannot be dated exactly either.

The few drinking vessels (bowls and cups) excavated at the site have some type parallels from nearby Casale Nuovo. Bowl type III.1 and cup type V.1 are, for instance, known from Casale Nuovo context US 141 and context US 11 (Angle *et al.* 1992, 1993). Type III.1 has type parallels dating to the recent to final Bronze Age while type V.1 can be dated to the final Bronze Age.

In 2002 one worn shard of depurated clay with slip decoration was recovered at P 13 (fig. 11), which could belong to an Italo-Mycenaean bowl due to the context in which it was found and the lack of exact type parallels from Mycenaean contexts (Mountjoy 1999).

Close type parallels of the pottery excavated at P 13 are found at Torrioraccio Period 2, 3 and 4 (Cassano *et al.* 1978). This site in the Agro Tarquiniese was recently dated by Pacciarelli to

Bronzo Recente to Bronzo Finale 3, in absolute years according to him from 1325/1300-950/925 BC (Pacciarelli 2000, 68, 95-107).

At this stage of our research, we date P 13 to the Late Bronze Age on the basis of the pottery. Two radiocarbon samples from animal bones found in the lower levels of trench F (spits 9 and 10) date the context to the 14<sup>th</sup>-11<sup>th</sup> century BC:

1. GrA-22090 2945 ± 45 BP 1310-1000 BC  
taken from P 13 F.s9.14 95.4% probability calibration (Oxcal v.3.5)
2. GrA22092 3005 ± 45 BP 1400-1080 BC  
taken from P 13 F.s10.14 95.4% probability calibration (Oxcal v.3.5)

Interpretation of the calibration of the 14C dates, in combination with the pottery types, makes a date around the 12<sup>th</sup> century BC most likely.

#### § 2.4 Stratigraphy and related artefacts

Here we discuss the stratigraphy and related artefacts at P 13, a number of post-depositional processes that may be held responsible for the formation of the various deposits, and possible deposits formed contemporaneously with the shards found in it. We may base chronological and functional interpretations of contemporary human activities at P 13 on the latter.

The topsoil is clearly a recent aeolic deposit that has buried the site under a substantial layer of fine and loose sand, occasionally containing Roman shards. Below this there is the brownish layer 1 that has been described earlier in this report as a compact sandy to gritty layer con-



Fig. 11. Photograph of possibly an Italo-Mycenaean cup.

taining both Roman and protohistorical ceramics. The amount of Roman material in layer 1 is very low compared to the protohistorical shard content (table 1), and in our view points to a situation in which original deposits containing protohistorical fragments (layers 2 and 3) became mixed with the loose and sandy topsoil of the recent dune containing off-site Roman material. Together these formed layer 1. Therefore we believe that layer 1 is most probably of post-Roman origin. The homogeneity and extent of the deposit may be an indication that it was formed through mechanical means.

The off-site hypothesis for the presence of Roman material in layer 1, however, does not apply to the Roman material in trench C, where we may interpret the presence of amphorae as the result of Roman activities that have disturbed deposits of protohistorical origin (layer 3). Unequivocal evidence for Roman activities is found all along the coast between the Le Grotta section and P 13, in the form of pockets filled with amphora shards in the sand body and in the silty clays of the valley immediately north of P 13 (see below). On P 13 itself the amphora shards in trench C were associated with a blackish somewhat sticky soil (layer 2) that appeared to have a higher silt and clay content than found elsewhere on the site. It was also capable of holding water much longer than the sandy deposits. The deposit with Roman shards either overlies or adjoins the deposit with mainly protohistorical remains (layer 3). It is thought that some Roman industrial activity at the site is responsible for the formation of this deposit of mixed Roman and protohistorical finds.

The grey compact fine-grained sandy deposit labelled layer 3 contains, at places, very dense concentrations of protohistorical shards and tuff chunks, but no features were encountered in it. The layer is not level but slopes towards the valley. In trench D, the shard concentration appeared at a higher quota than in trench G, apparently without being connected. The protohistorical deposits are interpreted by us as various dumps into the uneven dune sand, and related to actions taking place in the later Bronze Age/Early Iron Age at or near P 13. The sheer number and size of the protohistorical shards, the old fractures and the fact that it was possible to refit a substantial number of the shards, indicate that *in situ* protohistorical features cannot have been far removed from the spot where they were found. The protohistorical assemblage (especially as recovered from spit 8 in trench B and from the lowest spit

of trench E) is characterized by an association of shards of storage jars (*dolii*) and often burnt tuff chunks with worked surfaces. The small amounts of table ware (*tazze* for example) and bones clearly indicate that we do not deal with settlement debris. As the result of a not-yet-understood post-depositional process, occasional Roman shards intrude in deposits of protohistorical origin (layer 3), such as, for example, the lower protohistorical layers in trenches B and E and the protohistorical deposit of shards on the promontory in trench D. In the latter case the intrusion of a few Roman shards may perhaps be attributed to the planting of shrubs.

The study of the stratigraphy at P 13 has resulted in the identification of several layers containing potshards dating to the later Bronze Age and the Roman Republican period. Layer 3 was identified as an *in situ* layer of protohistorical date, but no specific features were found that point to any *in situ* activities; the layer is rather to be interpreted as a dump related to nearby workshop activities, possibly the preparation of salt and/or fish as will be suggested below. These workshops or activity areas may have been located on a higher part of the dune on the lower slope of which we have carried out our excavation, which is now eroded by the sea. There is evidence that P 13 was only one of many of such activity areas, as the following discussion of a number of comparable deposits seems to indicate.

#### § 2.5 Coastal deposits of protohistorical origin in Etruria, and their interpretation

A direct parallel for P 13 is provided by a specific protohistorical context in the district of Le Saline on the coast of South Etruria, at a distance of ca. 9 km from the ancient site of Tarquinia. The context is described as an organic stratum with a length of ca. 10 m 'contenente esclusivamente resti di grandi contenitori di impasto rosso-bruno'. The large containers are described as consisting 'in gran parte da olle e doli di medie e grandi proporzioni, realizzate probabilmente in loco con un caratteristico impasto di colorazione rosso-bruno, a volte decorati con cordoni plastici sul corpo o sotto l'orlo' (Mandolesi 1999, 174). As at P 13, table ware is almost absent from the artefact assemblage of this context, and no mention is made of settlement debris in the form of bones, seeds or building remains. The site is part of a series of exposures of protohistorical strata generally dated to the Villanovan period (Mandolesi 1999, 174) in an area of about 60 ha both on the

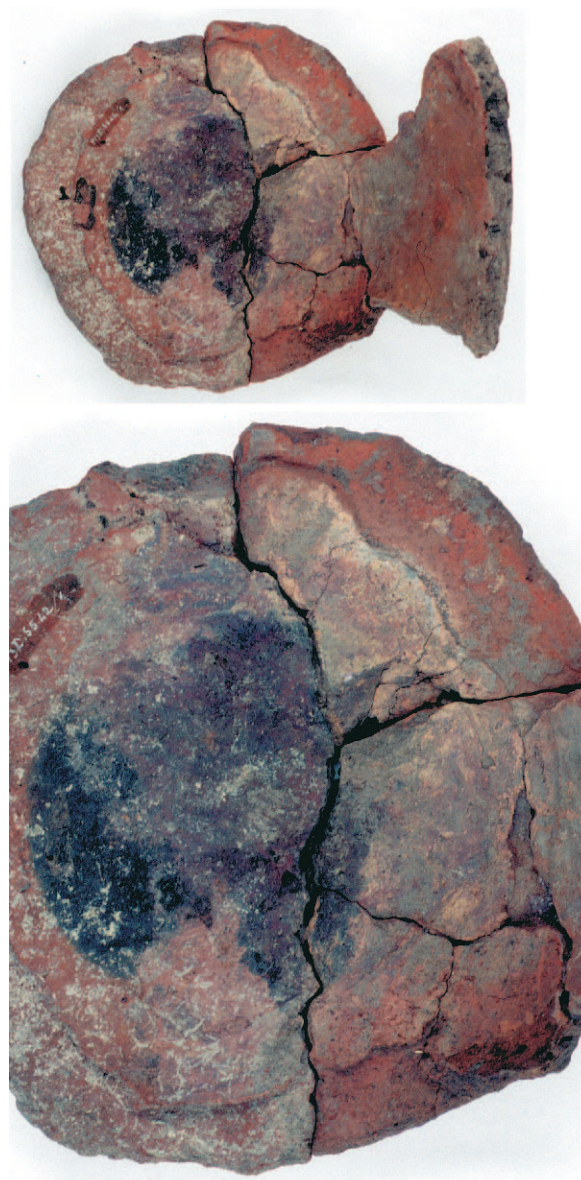


coast and more inland. A second context furnishing a direct parallel for P 13 comes from Scolo dei Prati in the same area. During cleaning of a canal in località Fontanile delle Serpi a stratum became visible that also contained almost exclusively remains of large containers that were typologically assigned to the Late Bronze age or to the earliest Iron Age at the latest. Again almost no tableware was recovered and no mention was made of any associated settlement debris (Mandolesi 1996, 56). Scolo dei Prati may represent 'the first approach toward the coast of a rejuvenated Tarquinian community that slowly, from final Bronze to early Iron age, put out roots in this landscape', and is seen as part of a series of minor sites with specific functions in the control and exploitation of resources (exploitation of the lagoonal environment for salt and fish). Towards the end of the Bronze Age Mandolesi also postulates a residential interest in the area slightly more inland from the coast. The coastal sites are placed by Mandolesi in close relationship with developments in Tarquinia itself: 'the fact that the process of appropriation of the coast occurs at the same time as the first intensive proto-urban settlement development [at Tarquinia] is significant' (Mandolesi 1996, 57). The evidence available at present, according to Mandolesi, points to the growth of a complex settlement system in the early Iron Age with Tarquinia at its centre.

#### § 2.6 Salt production

The site P 13 and the ceramics recovered from it do not appear characteristic of a permanent settlement (closeness to the sea; closely packed, large, well preserved shards; fragments fit and bases/rims could be reconstructed; a preponderance of crudely made storage jars; traces of burning etc.). The limited range of ceramic types makes it likely that a specific activity took place. In addition, some of the base fragments displayed 'salt colours' (Lane and Morris 2001, 41; Crosby 2001b, 410-412): some containers from P 13 display a range of pinks, whites, greys and lavenders on the inner surface possibly caused by direct contact with brine (water saturated with salt) under moderately high temperatures. Base fragment P 13D.s5.12/1, illustrated in *fig. 12*, exhibits the discolourations weak red (10R 4/2, 4/3, 5/3), pale yellow (2.5 Y 8/2), black (2.5 Y 2.5/1; Munsell 1994), pale red (10R 6/2), and pale pink (5 RP 8/2) to greyish red purple (5 RP 4/2; Rock-colour chart committee 1963). It is not clear why these colours appear on ceramics during salt pro-

duction, but Matson obtained comparable colours while firing salt-containing clays (Matson 1971). Nevertheless these characteristic colours occur only occasionally on vessels which have been used for the manufacture of salt. Crosby described the late Iron Age to early Roman period salt-making evidence from the Bourne-Morton Canal (Lincolnshire, England) and stated that five out of 117 container shards 'exhibit pinkish or lavender 'salt colours' on the inner surface' (Crosby 2001a, 293).



*Fig. 12. Photograph of salt colours on shard P13 D.s5.12/1.*

Another indication for the interpretation of P 13 as a saltern is the composition of the ceramics assemblage recovered. 'Briquetage' is the generic term for the ceramic equipment (containers, supports etc.) and the fragmented debris of hearths/ovens used in the processing of sea salt (Lane/Morris 2001, 8). The composition of the briquetage from several salterns is characterized by the predominance of large containers for the boiling of brine in order to produce salt crystals (cf. Lane/Morris 2001, 252; Chowne et al. 2001; Daire 1994). A comparable predominance of large containers is found at P 13. The shards were found stacked.

A reconstruction of P 13 as a salt producing site would involve the processing and manufacture of salt from tidal sources. The tide would fill man-made basins, which could then be closed off from further intruding seawater. Under the influence of wind and sun the salt concentration of the seawater in the basin would increase due to evaporation. Salt then crystallises once the water is saturated with salts. In prehistoric times the process of salt winning often involved artificial evaporation of water using containers above fires (Gouletquer et al. 1994, 123-161). Whether this process took place at P 13 is not entirely certain since structural features have not been excavated, but burnt fragments of tuff which may have been used as supports for the containers were found in large numbers. The evidence points to the exploitation of marine resources while using fire and large containers; alternative activities around P 13 could be the boiling of food in seawater or the production of preserved fish and processed fish products. Several Roman fish ponds have been recorded along this stretch of coast (Higginbotham 1997) but although the exploitation of fish resources near P 13 in prehistory seems likely also, no hard evidence such as fish bones was recovered.

The importance of salt for both humans and animals cannot be stressed enough, but will not be covered in this article; an acclaimed introduction to the topic was published in 2002 (Kurlansky 2002).

There are several other prehistoric sites associated with salt production along the west coast of Italy. Most familiar are the salt beds at the mouth of the Tiber, which were connected by the Via Salaria via Rome to the Sabine and Umbrian hinterland, a route in use from the Bronze Age onwards (Giovannini 1985; Coarelli 1988a; 1988b). Waarsenburg and Maas recently put forward the hypothesis that a comparable situation may have existed along the Astura river, with Satricum as a fording place (Waarsenburg/Maas 2001). Mandolesi assembled evidence for the early use of the *saline*

near Tarquinia, where pottery comparable to the ceramics recovered at P 13 was found during a survey (Mandolesi 1999, 174-176, 194-204). The coastal area near Pisa also functioned as a salt-making centre since the Bronze Age (Pasquinnucci/Menchelli 1999; 2002). Saltmaking appears to have been a common activity during the Middle and Late Bronze Age along the west coast of Italy. Lane and Morris, who published various prehistorical to Roman salterns in the Fenland of Eastern England, proposed a two phase model of production and settlement, labelled 'Opportunistic' and 'Permanent Settlement' (Lane/Morris 2001, 385-388). The opportunistic phase is characterized by non-permanent, seasonal settlements in the vicinity of the salterns. Saltmaking was periodical and linked to transhumance, looking for suitable spring and summer grasslands. To quote Lane and Morris: 'The excavation of such an identified saltern site must reveal quantities of briquetage and a paucity of well-preserved animal bone and domestic pottery. During this phase, settlement sites unaccompanied by briquetage debris are not found within 2 km from the known saltern sites. Saltmaking consisted of exploration and seizing the opportunity to make salt when and where environmental conditions allowed' (Lane/Morris 2001, 385). The evidence from P 13 conforms remarkably well to this description.

### 3 OTHER DEPOSITS OF PROTOHISTORICAL ORIGIN ALONG THE COAST BETWEEN NETTUNO AND ASTURA

Along the coast between Nettuno and Astura a number of other exposures of protohistorical origin appear exposed by marine erosion. Some of these were, like P 13, first mapped by Fabio Piccarreta in the 1970's. The coastal area was investigated in more detail by the Italian protohistorian L. Alessandri in the period 1999-2000, extending the research area to all of the coastal zone between Ostia and Terracina, and even further south to the mouth of the Garigliano river. Alessandri was able to provide more accurate datings to the protohistoric material and made other important observations that are helpful in the interpretation of the deposits (Alessandri 2000-2001). As part of the Astura project, the Groningen Institute of Archaeology was allowed to take extensive ceramic samples from sections in this area for further analysis. In the following the observations by Alessandri and ourselves are presented in combination. In general, all the investigated deposits are characterized by the

presence of darkish strata often containing dense concentrations of red impasto, but only in a few cases were certain features detected in the sections. Shard deposits were found to occur both in sandy and in clayey soils. Where applicable, inventory numbers and toponyms used by Piccarreta and Alessandri are given in brackets to avoid confusion over site identities and locations.

*Depuratore (fig. 2, 13)*

*(Alessandri site 13, Nettuno)*

The Depuratore exposure is located near the town of Nettuno and is situated on the beach. It was first recorded by Pacciarelli in a letter to the Archaeological Service in 1976 (Di Gennaro/Pacciarelli 1976, cited in Alessandri 2000-2001). It was described in detail by Alessandri, who recorded the section as having a total length of 150 m, some 10 m of which was drawn by him (Alessandri 2000-2001, fig. 2). He records three strata: a top stratum of about 70 cm with only very small fragments of impasto assembled in a chaotic way; a second stratum of on average 20 cm with dense concentrations of impasto (40-50%) more or less deposited in a horizontal manner;

and a third stratum without any ceramic finds. A small test-pit excavated by Alessandri yielded 1138 impasto fragments weighing 11 kg, which per cubic meter means ca. 11.000 fragments weighing ca. 100 kg. The pottery almost exclusively consisted of large forms (*dolii* and large *olle*). On the basis of this material, Alessandri proposed a dating of the deposit between the 8<sup>th</sup> and 7<sup>th</sup> centuries BC. In the 2002 campaign a larger part of the exposure was drawn. As the coast is characterized by a series of protruding parts of the dune, alternating with small inlets, the exposure was subdivided in various sections indicated as A-O in figure 13. A number of pottery samples were taken, of which diagnostic pieces have been drawn and described (Tol 2003). From A to I the soil profile is consistently made up of a sequence of various types of topsoil covering a greyish deposit without finds, followed by a stratum of greyish soil with few finds (in combination these form Alessandri's stratum 1). Below this, a grey layer with dense concentrations of impasto (Alessandri's stratum 2) rests on top of various archaeologically sterile layers that characterize the local subsoil.

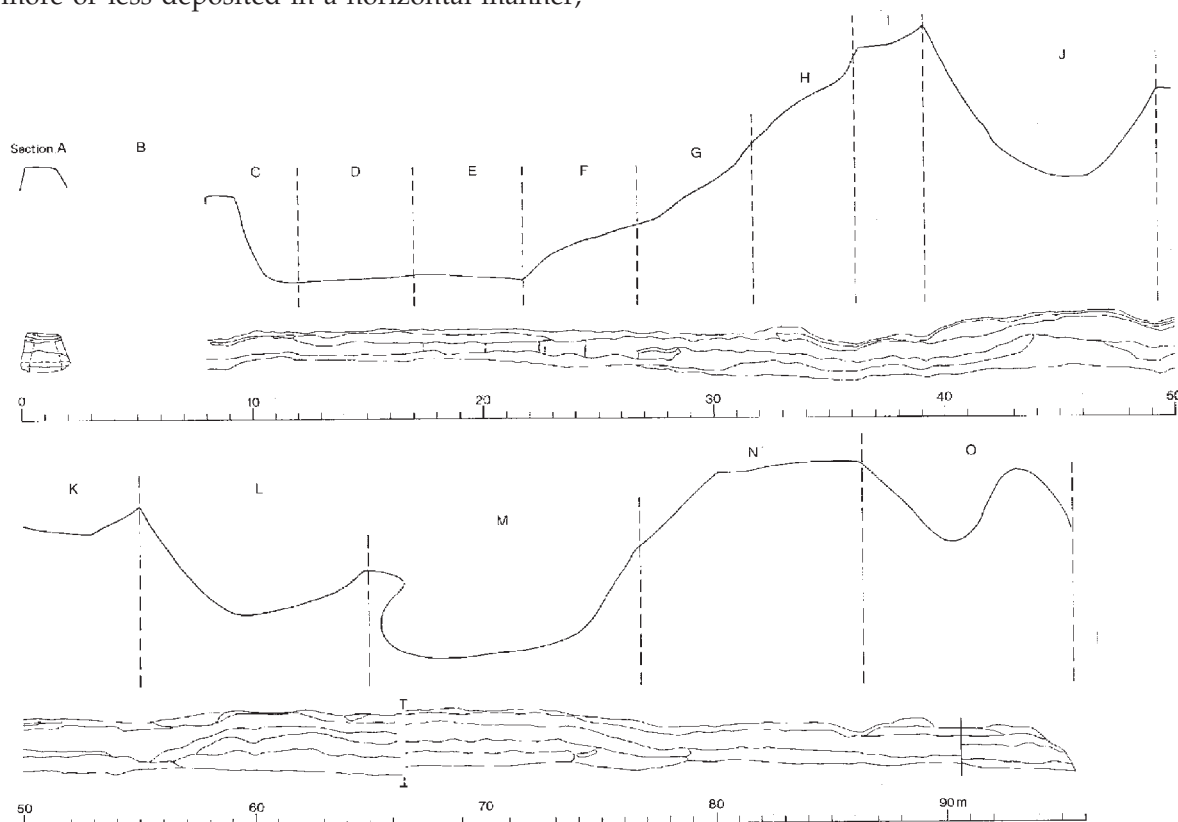


Fig. 13. Depuratore section.

It was observed that the impasto shards in section A are much smaller than in sections B to I, being described 'crumbled'. In sections E, G, and at the point where sections H and I meet, ceramic samples were taken for dating and fabric analysis. The samples were taken out of dense concentrations of shards that proved, however, not to be refittable. Section G yielded pieces of a large storage jar (*dolium*) as well as the outline of a pit-like feature with a fill of reddish soil; it did not itself contain any shard material. No interface was visible between pit fill and sand body, but the fill is sealed by the stratum with finds. From section I onwards, the soil profile changes and a range of new layers appear that are not published here. In this part of the exposure the number of finds diminishes greatly. A preliminary study of the material corroborates the dates given by Alessandri.

It is most probable that the deposit of Depuratore is not *in situ* and was formed as a result of levelling activities related to the building of a water purification installation nearby. The sheer density of finds and the preponderance of large ceramic forms points, as at P 13, to workshop activities nearby. There may, however, also have been Iron Age graves in the area, as the stray find of a bronze fibula suggests.

*Fosso Foglino*  
(Alessandri site 15)

In the winter of 2001 Alessandri mapped a surface scatter of protohistorical shards at Fosso Foglino that, for a distance of ca. 120 m, ran parallel to the beach. These surface finds were mixed with shards of later date. In July of that same year

a revisit showed that no more protohistorical finds were to be found, due to marine erosion of the finds layer. The shards from this site are dated to the first phase of the Middle Bronze Age, demonstrating early human activity along the coast.

*Carnevale* (fig. 2, 14)  
(Alessandri site 16, Finocchierelle; Piccarreta 1977, site 16)

750 m to the northwest of the Carnevale valley, an exposure previously recorded by Piccarreta was also reported by Alessandri. The exposure is regularly flooded, being only a few meters distant from the sea. Only two layers can be distinguished. The topsoil consists of black and sticky clayey soil on top of a greyish brown layer with concentrations of impasto pottery at some points. The 50 m exposure was subdivided into sections A-F by us and subsequently drawn. From sections C and D ceramic samples were taken, but these contained smallish and rounded impasto shards only, corroborating the observations by Alessandri. The samples could only be used for fabric comparison with material from other exposures. A tentative date for now would be late Bronze Age/early Iron Age.

*Le Grottacce* (fig. 2, 15)  
(Alessandri site 17, Le Grottacce; Piccarreta 1977, site 15)

In 2001, we excavated a stratum of brownish sandy soil containing dense concentrations of impasto shards at the north-western extremity of the ruins of the Roman villa of Le Grottacce (fig. 15). The stratum forms a sort of plateau worn by the

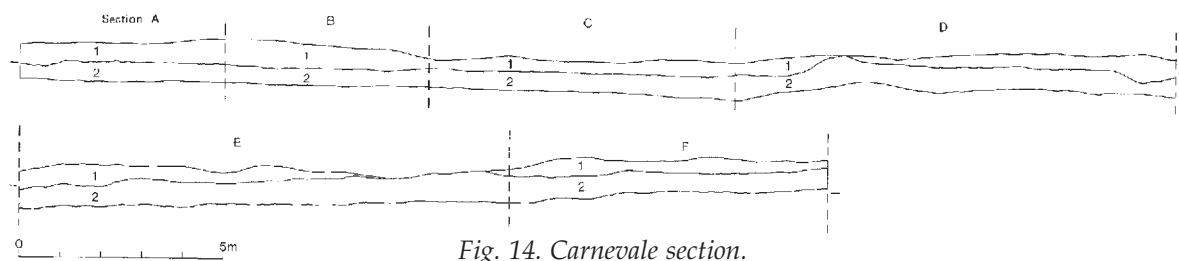


Fig. 14. Carnevale section.

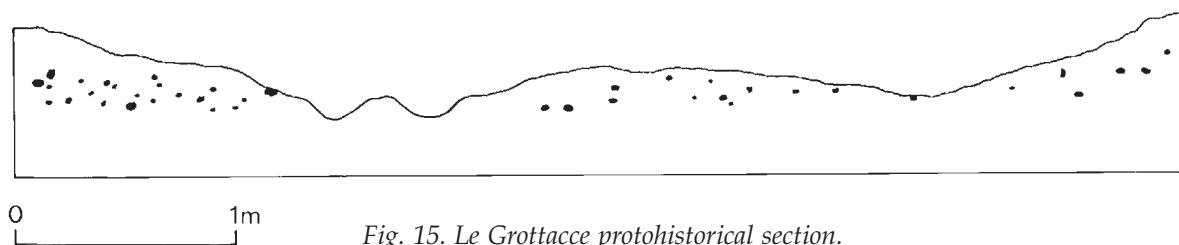


Fig. 15. Le Grottacce protohistorical section.



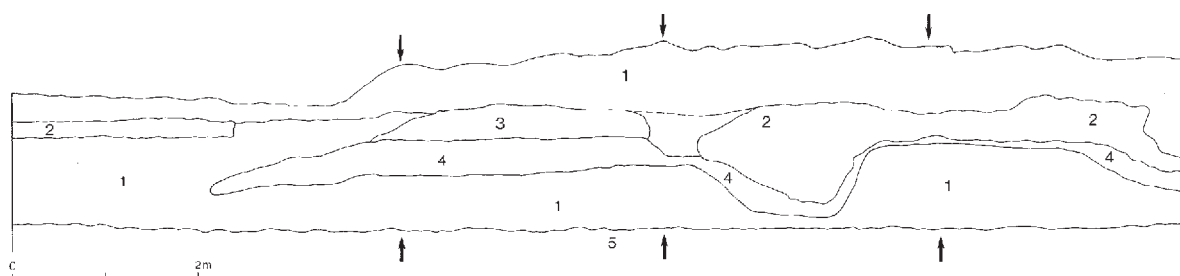


Fig. 16. section between P15 and P13 (70 m northwest of P13). 1 = Topsoil of loose dune sand; 2 = layer with Roman shards; 3 = layer with mixed protohistorical and Roman shards and building debris (tuff and tiles); 4 = layer with protohistorical shards; 5 = red sands.

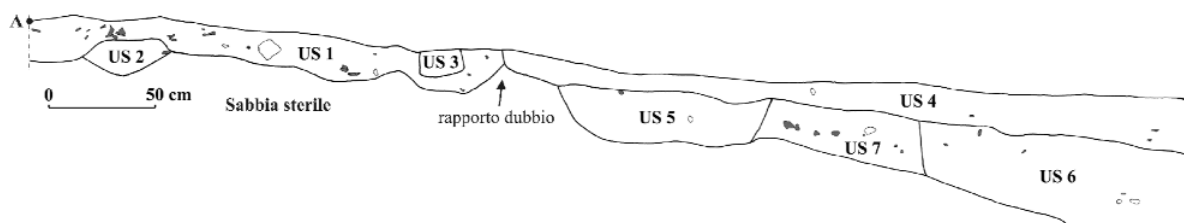


Fig. 17. La Saracca section (after Alessandri 2000-2001, Saracca, site 19, fig. 2).

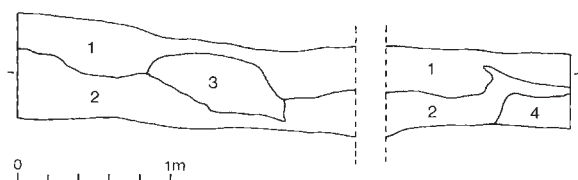


Fig. 18. Bottego 1 section; layers 3 and 4 contained impasto, tuff and unbaked clay.



Fig. 19. Photograph of surface finds at Bottego 2.

sea at 70 to 50 cm above beach level, originally sealed by Roman strata. The plateau is about 430 cm wide and 350 cm deep and lies between a Roman wall and deposits of Roman debris, including

large bricks. To the north of the Roman wall remains of the same stratum were sampled as well. The majority of the shards were recovered from the upper part of the stratum. The ceramics were dispersed and worn and the stratum apparently forms a secondary deposit in which the shards derive from a site in the neighbourhood and were washed down to their current position before the construction of the Roman villa.

The material collected in this investigation consists of storage jars (type I.1, I.2 and I.4), jars (type II.1) and bowls (type III.1) (fig. 10). Since shards from this site conform to the typology of the ceramics recovered from P 13 it follows that the shards retrieved from the plateau at P 15c can also be dated to the Late Bronze Age.

#### *Exposure north of P 13 (fig. 2, 16)*

In between Le Grottacce protohistorical section and P 13 we recorded a small exposure with a stratum of protohistorical remains below a stratum of Roman building debris. The section is located 70 m northwest of P 13 in a sand body. The shards recovered are not very diagnostic, but will be contemporaneous with one of the phases of P 13 and P 15. A broad band handle recovered from the section may date to the Bronzo Recente. The presence of a protohistorical stratum at this location indicates that at both sides of the small valley to the northwest of P 13 the protohistorical activity area continued.

*Saracca and Bottego 1-3 (fig. 2, 17-19)*  
(Alessandri site 19, *Saracca*; Piccarreta 1977, site 9)  
Southeast of P 13 near the military watchtower 'Bottego', in an area called Saracca, the presence of protohistorical remains was first observed by Piccarreta and later described in more detail by Alessandri. We first report on Alessandri's observations. Alessandri described a highly interesting exposure of protohistorical remains at Saracca, which lay partially below Roman wall fragments (fig. 17). In the sandy subsoil, he noted two pits filled with a fine grey clay. As with the pit recorded by us at Depuratore, no interface between the subsoil and the fill could be discerned ('con il passare degli anni si sia resa impercettibile la differenza rispetto al riempimento', Alessandri 2000-2001, 44). The pits are associated with the preparation of clay for a pottery workshop; the clay is probably provenient from a nearby exposure of the *marne azzurre*. The pottery in the strata connected with these pits is securely dated in the period of the Bronzo Recente.

In the 2002 campaign additional observations were made in the dune slightly to the northwest, where we recorded a site consisting of patches of dark sandy soil containing partly refittable shards. This find spot, not yet dated, but also securely of protohistorical date, is referred to as Bottego 1 and a section is presented in figure 18. Most of the impasto is secondarily burnt and was associated with tuff chunks, suggesting the presence of some structure. A number of slices of unbaked clay were found in the pits, presumably to have been used for potting. As the area has not been cleared by the military, no excavation could be carried out here for safety reasons.

To the southwest, two more sites with surface finds were visited, one on the beach and one on the slope of a dune. Whilst it is clear that we are dealing with protohistorical shards related to sites of the same chronology as described above, no good contexts were found (fig. 19).

#### 4 THE LE GROTTACCE EXPOSURE

##### § 4.1 Introduction

In 2001 as part of the Astura project, the cliff section created by the sea at the location of the Roman villa of Le Grottacce was investigated. Most of the features in this section can be linked to the Roman period complex, but some Palaeolithic and protohistoric remains (see above) were mapped as well. The most conspicuous archaeological remains are a thick sequence of strata

referred to as the amphora section, various architectural features and several features with a fill of Roman amphora shards referred to as 'amphora pockets'. These features were previously mapped and described by Piccarreta (1977), but a detailed study was lacking so far. The results of our work have been published as an internal report (De Haas 2002).

#### Piccarreta's description of Le Grottacce

The site of Le Grottacce was previously described by Piccarreta (1977, 76-84), who distinguishes three different parts of the villa complex, from south to north respectively P 15a, b and c (fig. 20). P 15a consists of two enormous walls in *opus incertum*, running more or less at right angles to the beach, and forming the sides of a terrace on which part of the villa was built. On top of this terrace, a wall in *opus reticulatum* with a doorway indicated the floor level of this villa building. A drainage canal as well as wall fragments and pieces of mosaic floors were found on the beach at the base of the terrace; the latter indicate that P 15a was a luxurious residential area that, according to Piccarreta, dated to the early Imperial period.

P 15b consists of the remains of a large building with walls in *opus reticulatum*, *incertum* and *mixtum*, and is interpreted as a bath house. Several rooms could be distinguished, one of which has an apsidal shape. On the beach, remains of drainage canals, pavements in *opus spicatum*, plaster wall decorations, and mosaic floors were found. Piccarreta proposes at least two building phases

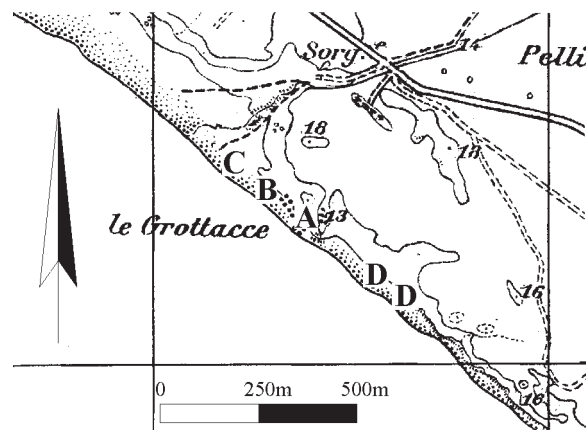


Fig. 20. Location of features investigated at P15  
(A: P 15a; B: P 15b; C: P15c/amphora section;  
D: amphora pockets).



Fig. 21a. Northern part of P 15c with below proto-historic strata, strata densely packed with amphora shards, Roman wall and to the right mattoni belonging to a kiln.

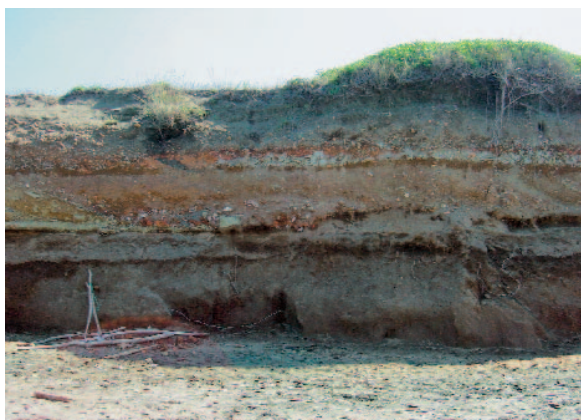


Fig. 21b. Central part of P 15c with to the left possibly in situ pavement, covered by levelled layers.

for the bath house, as walls in *opus latericium* blocked several earlier doors and one mosaic floor was later covered by another floor in *opus spicatum*.

P 15c consists of the remains of two wall foundations, the southern one still showing a small section of the *opus reticulatum* wall facing. Furthermore, brick bases were observed at regular intervals of 5 m over a length of 25 m, which according to Piccarreta supported the floor of a 30 m long drying building (*essicatoio*). The floor level of this building - indicated by the height of the supports and the *opus reticulatum* wall fragment - is at the present top of the section. Piccarreta also observed that this building was erected on a platform made of debris from previous activities in the same location, including the remains of kiln structures. At the level of the wall

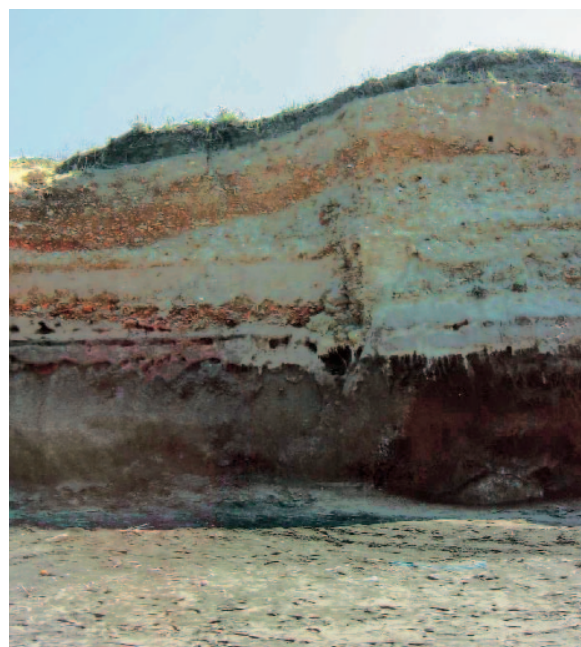


Fig. 21c. Southern part of P 15c with debris layers partly running over a Roman building.

foundations he reported some finds of impasto comparable to the material at P 13.

In combination, Piccarreta's observations indicated that Le Grottacce was a large villa complex with a luxurious residential area (P 15a), a bath house (P 15b) and a workshop (P 15c), which seem to have been in use contemporaneously and to date to the late Republican and early Imperial period. Piccarreta estimated that the complex extended for about 100 m inland, with a substantial part of the site already destroyed by marine erosion.

#### The Astura 2001 fieldwork

Over a period of two weeks, all of the amphora section (P 15c in Piccarreta's description) was plotted and described. Various features in other parts of the section were individually mapped; these included walls and structures of the Roman villa as well as several 'pockets' of amphora shards that were exposed along the beach further to the south. The objective of these investigations - besides complementing Piccarreta's description of the villa complex as a whole - was to establish whether the remains of the workshop at P 15c contained evidence of amphora production (remains of kilns and wasters), and subsequently to establish a typology of the Le Grottacce amphorae.



## § 4.2 The amphora section

During preliminary investigations in 2000, P 15 was visited especially for the amphora material and kiln remains at P 15c. Samples of shards were collected, and a more detailed and systematic study was planned for 2001. During the Astura

2001 campaign, the amphora section was drawn over a length of 120 m. (fig. 21a-c), with a height between 2 and 7.5 m.<sup>2</sup> Some 75 layers and 7 features (mostly Roman walls) were recorded. A total of ten material samples was taken, consisting of amphora shards, protohistoric shards, kiln or building debris, wasters and charcoal. Figure 22 a-i

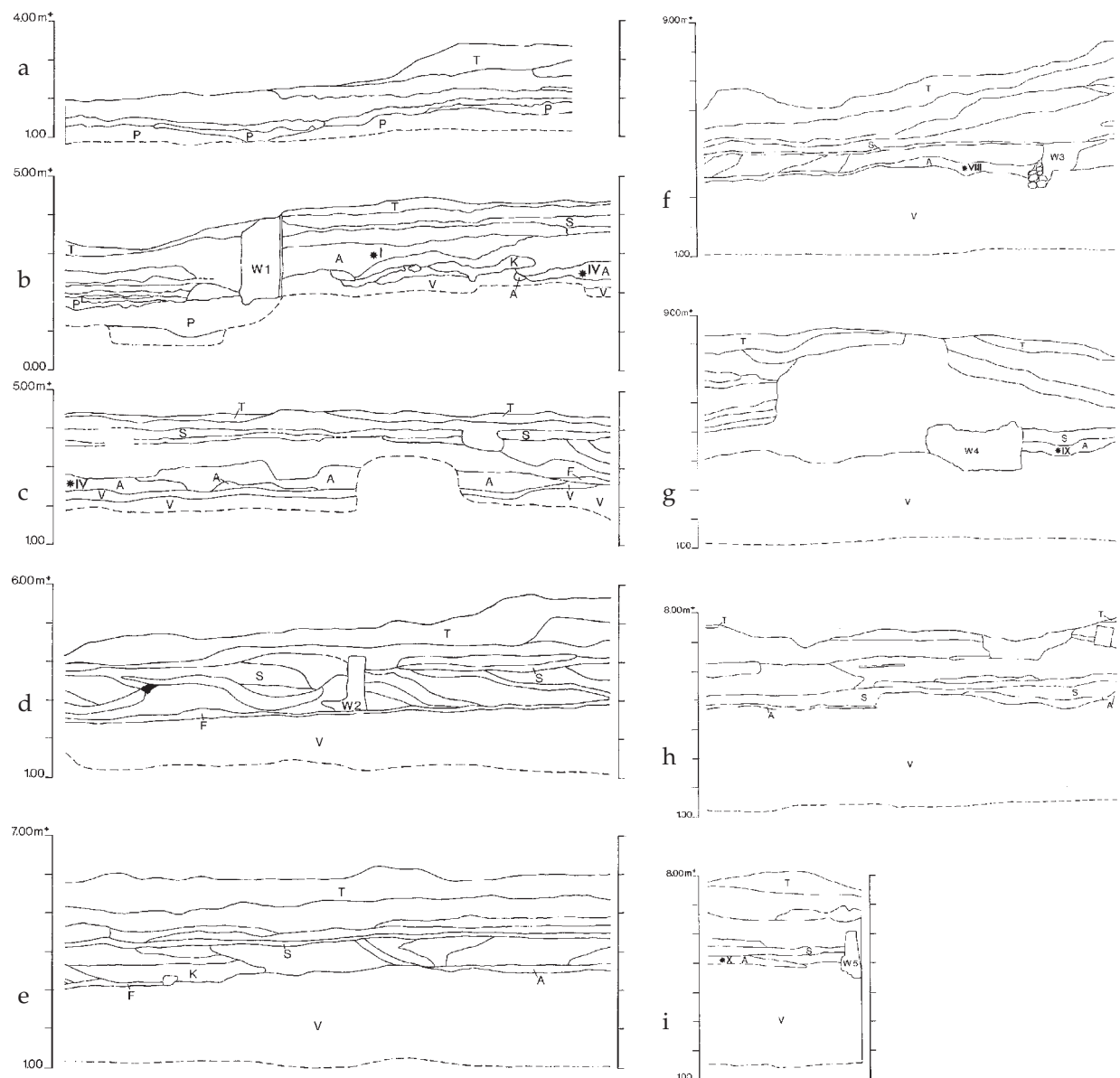


Fig. 22a-i. The amphora section drawing from north (a) to south (i). Indicated are: T = topsoil (dune sand); A = layers with dense deposits of amphorae and tiles; P = layers with protohistoric shards; K = layers with kiln debris; V = virgin soil (Pleistocene sands, sometimes with lithics and a few washed-in impasto shards); F = probably in situ layers of the first Roman phase; W = Roman walls; S = sterile sand layer; \* origin of amphora samples.



shows a schematic representation of the section drawing. The broad stratigraphy is formed by (from beach level up):

- 1 a natural yellow sand layer, in some places containing Palaeolithic flint artefacts (indicated with a V in figure 22). This layer is similar to strata below P 13, and common along most of the coastline between Nettuno and Torre Astura (Blanc 1935);
- 2 a dark layer containing protohistoric impasto, found only in the northern part of the section (indicated with a P in figure 22);
- 3 various debris layers of Roman age;
- 4 a sterile sand layer (indicated with an S in figure 22);
- 5 several debris layers with Roman pottery and roof tiles;
- 6 dune sand, sometimes with some Roman shards. At some points plants have retained patches of topsoil (indicated with a T in figure 22).

In the following we will discuss the stratigraphy of the amphora section in more detail.

The most northerly stretch contains layers with late Bronze Age impasto, running down below the current beach level (see above § 3 Le Grottacce; fig. 22a/b). A fill-like feature was observed; perhaps it can be interpreted as part of a habitation stratum, but as we have seen above, the layers are most probably secondary deposits. Protohistorical material was also found to the north of the drawn section and, in combination, these observations indicate a considerable site. The protohistorical layers are partially covered by thin layers of fluvial or marine sands, possibly indicating the presence of a stream or inlet.

A thin layer consisting of small fragments of tuff is perhaps the only remaining in situ feature of the first Roman phase (fig. 22c-e). It may indicate some sort of outdoor pavement, although its relation to the rubble layers to the north is somewhat unclear. Other layers to the south and north of and covering this supposed pavement are all secondary deposits, some of which are densely packed with amphora and roof tile shards (fig. 22b, c). The northernmost of these layers contains burnt soil and wasters of roof tiles. Between the amphora layers lies a rubble layer, consisting of burnt red *mattoni* originally belonging to the upper structure of a kiln. Whilst these findings support the idea of a pottery workshop, there is no direct evidence for amphora production in the form of amphora wasters. Between walls 2 and 5, more amphora layers were observed to lie directly on top of the natural sand deposits (fig. 22e-i). These are less thick and more even than the

ones discussed above, and were not found in association with kiln debris.

Among the other significant deposits belonging to this first phase are some pit fills (fig. 22c, d) and a series of obliquely deposited rubble layers south of wall 3 (fig. 22d-f), consisting of sandy soil mixed with varying amounts of tuff and limestone fragments, roof tiles and occasionally some Roman pottery. One layer contains *mattoni* of the type described above and fragments of limestone, again indicating industrial activity in this area. These secondary deposits probably result from levelling in preparation of building work in a subsequent Roman phase. The deposits are covered by a thin, almost sterile layer of sand. Although this layer was interrupted or not very well visible at certain points and sporadically a few shards were found in it, these irregularities can probably be explained as later disturbances. The layer itself seems to have been deposited by the wind, indicating a probably rather brief period without human activity between the levelling and the subsequent building phase. The section south of wall 4 seems to contain a similar layer, but thicker, of a more compact structure and including some pebbles (fig. 22 g-i).

Several wall foundations in *opus caementicium* indicate two buildings in a second phase of Roman use. No clear foundation trenches could be seen, but the foundations were clearly dug through the sterile layer and the levelled first phase layers into the natural sands below. Piccarreta already described wall 1 (fig. 22b) as well as several brick bases to the south of wall 1 at the top of the section (see above). These bases were no longer in situ, and one of them had fallen down to beach level. Holes dug through the sterile layer may have been foundation trenches for these bases. Further to the south, two stretches of wall (walls 3 and 4) belong to a second, fairly large building (fig. 22f, g). These were not mapped by Piccarreta, and add to the total picture of the layout of the villa. A functional interpretation cannot yet be given for this building.

In the central part of the section, three distinct layers cover the sterile layer and the walls of the building described above: a grey cement-like layer, a pinkish layer consisting of very powdery roof tile fragments, and a layer of dune sand mixed with Roman pottery (fig. 21c). These layers increase in thickness to almost three meters above walls 3 and 4, but are mostly obscured by loose dune sand. Above and to the south of wall 4, a thick stratum of large cobbles was observed as well. In the southernmost section mixed debris

layers were observed, which can be related to the collapse of the building described above and of the bath house (P 15b). No information was obtained on the date of the decline of the villa complex.



Fig. 23. Photograph of P 15b.



Fig. 24. Photograph of column base on beach.



Fig. 25. Photograph of terrace of P 15a.

#### § 4.3 Isolated features

The coastal strip between the amphora section P 15c and the protohistoric site P 13 was investigated during the final two days of the Astura 2001 campaign. There is no continuous archaeological stratigraphy between the two sites so the archaeological features in between appear isolated. These features were numbered A-S, sketched, described and photographed individually. Two kinds of features were mapped: architectural remains and the so-called 'amphora pockets', several of which were excavated in 2002. Below we will discuss the features in detail in order from north to south.

Immediately to the south of the amphora section, the remains of the building described by Piccarreta as P 15b lie exposed (fig. 23). A *hypocaustum* floor heating system was observed, confirming Piccarreta's interpretation as a bath house. Of the surviving walls, one had been placed immediately in front of another, suggesting at least one phase of restructuring.



Fig. 26. Photograph of mosaic floor at P 15a.

Fig. 27a-e. Drawing of amphora pockets K-O. 1= sand layer, colour 10YR 4/4, 10YR 5/3, 10YR 5/4 or 10YR 5/6; 2 = dense shard deposits with compact sand fill, colour 10YR 4/4 and 10YR 5/4; 3 = sand layer like 1 but with iron stains; 4 = sandy silt layer, colour 10YR 4/4.

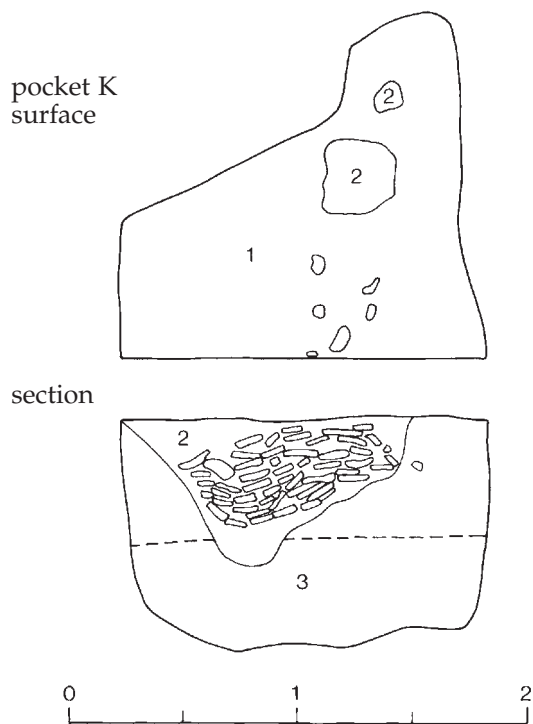


Fig. 27a. Drawing of amphora pocket K.

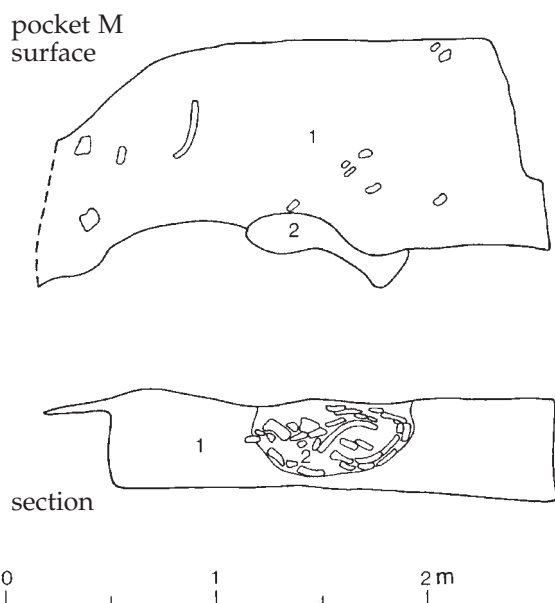


Fig. 27c. Drawing of amphora pocket M.

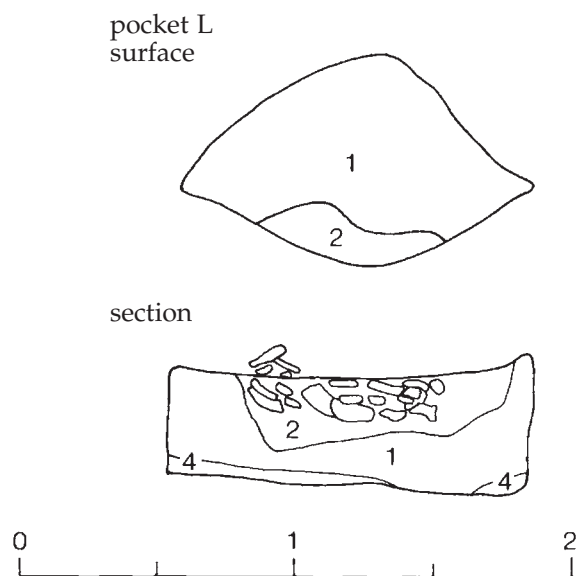


Fig. 27b. Drawing of amphora pocket L.

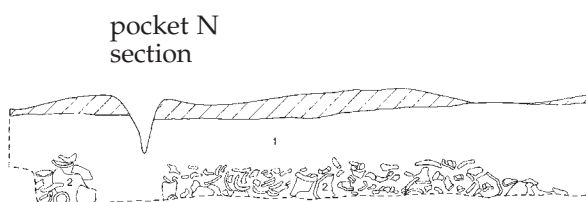


Fig. 27d. Drawing of amphora pocket N.

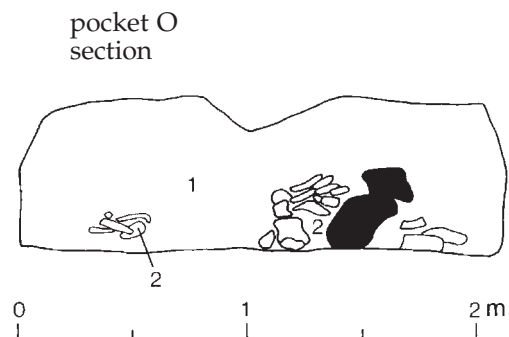


Fig. 27e. Drawing of amphora pocket O.



To the south of P 15b, additional features belonging to the villa complex were mapped. Several stretches of wall (foundations), a drainage canal and an 'amphora pocket' (a pit filled with densely packed, horizontally placed amphora shards, some sand and limestone) were observed. On the beach at P 15b, and some 15 to 20 m to the south, many architectural remains were still present, including several brick column bases (fig. 24). A portico or peristyle was possibly situated here, as well as at least one additional building.

The two large retaining walls of the terrace of P 15a could be traced for about 17 m (fig. 25). The floor level of the building on the terrace, at about three meters above the beach, is indicated by geometric and figurative mosaics (fig. 26). To the north of the terrace, several walls decorated with red painted plaster were mapped and in 2002 a floor level with part of a black and white mosaic was found. These features were probably part of the residential area of the villa. To the south of the terrace, a wall of polygonal tuff blocks with the entrance to a one metre high passage covered by a large tuff lintel was observed. The deviant building technique and orientation may point to an earlier date for this structure.

Three clusters of features were recorded between P 15 and P 13: a stratum with mixed protohistoric and Roman ceramics (this feature has been discussed above), and two clusters of amphora pockets. The pockets of the first cluster,

dug into the natural sand, are all between 0.70 and 1.25 m wide and 0.25 to 0.35 m deep. It was first thought that they might be part of drainage canals. In 2002, however, these pockets were drawn and excavated to establish their three-dimensional shape (fig. 27a-e). These excavations show that the features are not elongated, but form small refuse pits filled with horizontally packed amphora shards and, occasionally, some tuff fragments. One pocket contained an almost complete, horizontally placed amphora of Graeco-Italic type (fig. 28). The pockets seem to be related to the remains of a kiln observed by Piccarreta (Piccarreta 1977, 76: nr. 14), but this kiln could not be relocated during the fieldwork of 2000 or 2001 (Attema *et al.* 2001b). The pockets of the second cluster near P 13, dug into deposits of very heavy clay, were much more disturbed and also contain some bone and Roman building debris. The thick deposits covering these features made excavation impossible.

#### § 4.4 The amphora samples

Samples of diagnostic shards were collected from various layers in the amphora section and from the amphora pockets. These samples will be published in full in the final publication of the Astura project, but a preliminary typology is presented below (fig. 29).

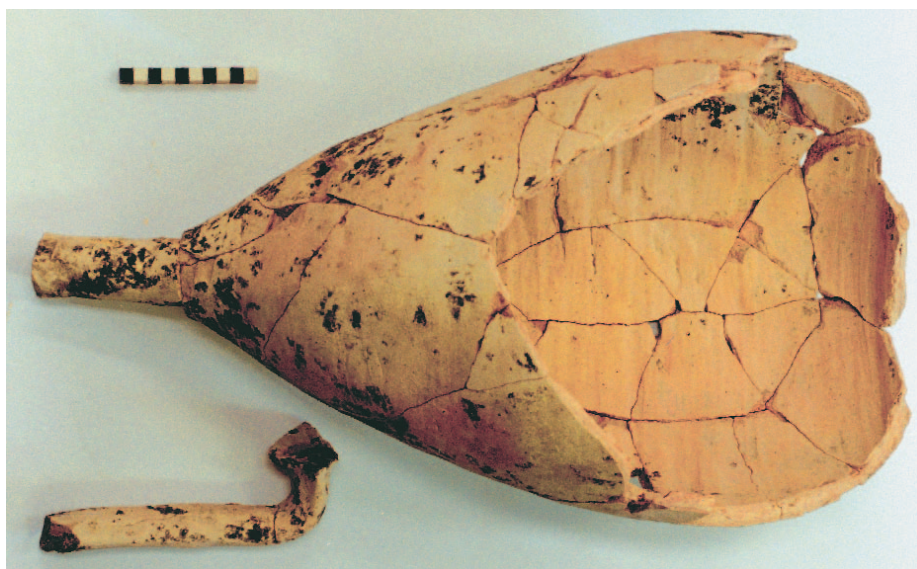
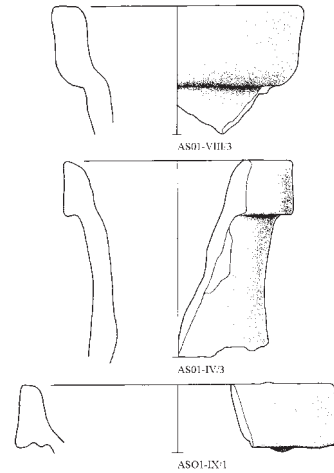
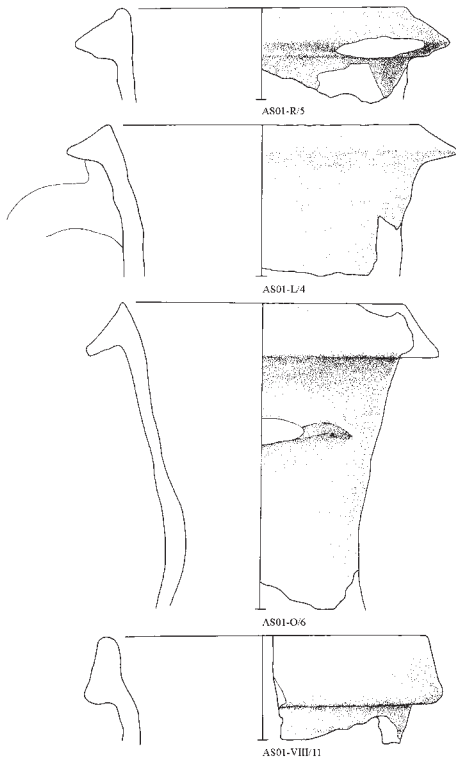


Fig. 28. Photograph of restored amphora of Graeco-Italic type.



Fig. 29. Typology of amphorae.

### Rims

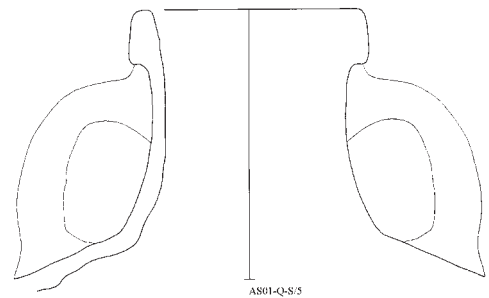
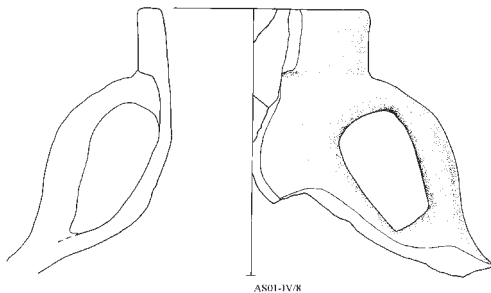


#### *Type 2 Dressel 1A rims*

Successor to Graeco-Italic type amphorae, generally characterized by a spiked base and a cylindrical body and neck. The long handles are oval in section, the rim is generally thickened on the outside, but variations in the shape of the rim occur. These fragments should probably be placed at the end of the 2<sup>nd</sup> century BC or the first quarter of the 1<sup>st</sup> century BC.

#### *Type 1 Graeco-Italic rims*

Generally characterized by a pear-shaped body, a carenated shoulder and cylindrical neck. The long handles are oval in section, the rim is usually triangular, but variations occur. These fragments should probably be placed in the second half of the 2<sup>nd</sup> century BC.

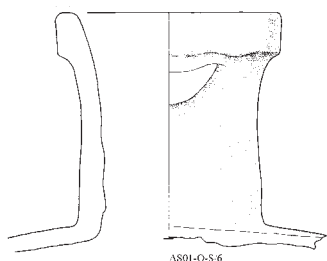


#### *Type 4 Unknown rim 'type B'*

Generally characterized by a short cylindrical neck and rounded handles, oval in section. The rim is similar to type 3, but at most 3.0 cm high. No parallels have been found for this type.

#### *Type 3 Unknown rim 'type A'*

Generally characterized by a short neck and rounded handles, oval in section. The rim is thickened on the outside and at least 3.0 cm high. No parallels have been found for this type.



#### *Type 5 Unknown rim 'type D'*

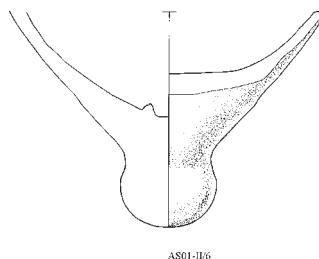
Generally characterized by an almost horizontal shoulder, making a sharp angle with the straight cylindrical neck. Handles are again rounded, oval in section. The rim is thickened on the outside. No parallels have been found for this type.

### Bases



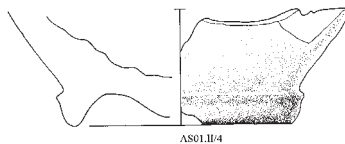
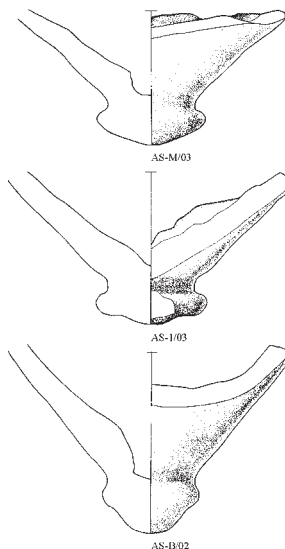
#### *Type 6 Graeco-Italic and/or Dressel 1A bases*

A few cylindrical spiked bases. Sometimes somewhat thickened, generally with a flattened base.



#### *Type 7 Dressel 6A base?*

One base fragment with a globular knob. The wall is flaring at a high angle. This piece is similar to the Augustan Dressel 6A amphora and may be a 1<sup>st</sup> century BC prototype. One other shard shows a similarly flaring wall, but is smaller in diameter.



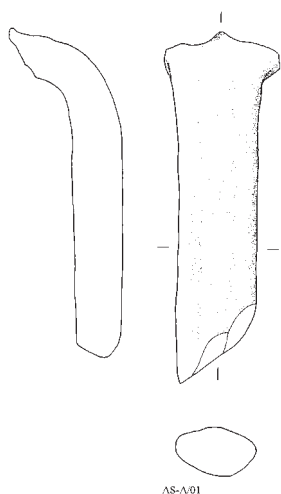
#### *Type 9 Unknown base of an open vessel?*

Characterized by a flaring ring base with a ridge on the outside. Perhaps it was originally part of an open, bucket-like vessel in which clay was stored or in which amphorae were put to dry after fabrication. No parallels have been found for this type.

#### *Type 8 Unknown base 'type B'*

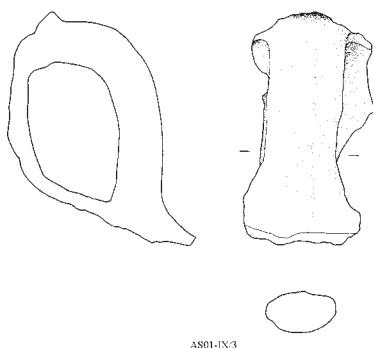
Knobbed base fragments with several variations. The knob is usually flattened, sometimes has an encircling ridge. Flaring wall. These bases probably belong to amphorae used for storage and transport of oil.

### Handles



#### *Type 10 Graeco-Italic and/or Dressel 1A handles*

Long, straight handles, mostly oval in section. So far, individual pieces have not been ascribed to either Graeco-Italic or Dressel 1A type amphorae.



#### *Type 11 unknown handle 'type A'*

Rounded handles, mostly oval in section. Should probably be linked to the rim types 3, 4 and 5.

Most of the shards are ascribed to the 'unknown' types 3, 4, 8 and 11. They probably belong to a type of amphora with a thickened rim, rounded handles and a knobbed base. The size of the handles indicates that these were small containers, probably used for regional distribution, but no parallels have been found. The rim shows a relation with early examples of Tripolitanian amphorae, while the bases match those of Brindisi type amphorae. This hybrid type of container can perhaps be seen as an experimental form that was only briefly produced and therefore not widely distributed.

The material seems rather homogeneous in clay composition. Two colour groups occur, focused

around 5YR 6/6 to 7.5YR 7/6 and 5Y 8/2 to 10YR 8/3, and representing a reddish brown firing and a yellowish white firing clay, the second group sometimes with a purple variant added. The clays are often badly mixed. Extensive suitable clay beds are known about 250 meters to the south of P 13 (Blanc 1935) and samples of clay from these deposits have been used for firing experiments. After heating, the clay samples acquired a pale colour similar to that of the amphora shards; it thus seems possible that these clay beds were used in the production of amphorae. Fabric analysis has shown that the amphora fragments contain large amounts of augite, a locally occurring inclusion of volcanic origin. These observations point to local amphora production on site P 15.

The amphora samples were taken from various contexts (see also figure 22). First of all, samples were taken from the thick strata densely packed with amphora shards, in which burnt soil, kiln debris and wasters also occurred. Secondly, amphora shards were collected from the thin layers which do not contain any burnt soil, kiln debris or wasters. Finally, samples were taken from the amphora pockets south of P 15a. The material from these three contexts seems to differ in composition, although the sampling method does not allow any statistical confirmation. Generally speaking, the samples associated with kiln debris mainly consist of material of types 3, 4, 8 and 11. The material from the other layers at P 15c is more diverse, including type 5 and occasional fragments of Graeco-Italic and Dressel 1A amphorae, types of amphorae widely produced along the Tyrrhenean coast of central Italy (Tchernia 1986; Monsieur/De Paepe 2002). Most of the material from the amphora pockets was ascribed to either Graeco-Italic or Dressel 1A type amphorae, although material of the unknown types is present as well. Since the various deposits all include amphorae of Graeco-Italic and Dressel 1A type, they can probably all be dated to a single period at the end of the 2<sup>nd</sup> or first quarter of the 1<sup>st</sup> century BC.

### § 4.5 Preliminary conclusions

Investigations at P 15 have shown human activity in various phases from the Palaeolithic to Roman times. Layers containing late Bronze Age and early Iron Age impasto point to the presence of a site of this date in the northern part of the area, although clear features could not be distinguished.

The Roman period shows an extensive use of



Fig. 30. Photograph of P 11.

the area up to P 13. To the north, secondary deposits point to workshop activity pre-dating the erection of the monumental villa. Tile production was certainly a part of this industry, and there are strong indications that amphorae were also produced. The amphora samples show a limited number of types including an as yet unidentified amphora type with a knobbed base, a short neck with rounded handles and a thickened rim; the amphora material was found in association with kiln debris; and local clay beds were available. The presence of Dressel 1A amphorae and the *terminus ante quem* provided by the *opus reticulatum* of the superimposed buildings indicate that this phase probably dates to the end of the 2<sup>nd</sup> or the beginning of the 1<sup>st</sup> century BC.

The remains of this first phase were levelled in preparation for large scale building activities. Piccarreta related one large building to pottery production (Piccarreta 1977, 81), while a second building was mapped in the northern part of the site this year. The remains of a bath house (P 15b), a fourth building, possibly a peristyle or portico, and a residential area partly on a large terrace probably all date to this second phase. Building techniques date the erection of this large *villa maritima* sometime in the second half of the 1<sup>st</sup> century BC or at the start of the 1<sup>st</sup> century AD. A third phase is indicated by the remodelling of the residential area and the bath house.

To the south of P 15, indications for protohistoric occupation were found as well as evidence for large scale interventions during the Roman period. The two clusters of amphora pockets may be interpreted as rubbish pits and, together with the previously mapped remains of a kiln, again point to local ceramic production.

## 5 THE EXCAVATION OF THE KILN SITE AT BOTTEGO

The excavation of the kiln near the observatory Bottego was begun during the 2000 campaign and was finished in the campaign of 2002 (see fig. 2 for its location). Altogether the excavation took approximately three weeks with two archaeologists involved (fig. 30). Piccarreta labelled this site no. 11 (Piccarreta 1977, 76-84). The kiln is constructed in a tuff outcrop, is approximately 4.5 m in diameter and is filled with dune sand and rubble, mainly deriving from the kiln wall. The kiln wall apart from the entrance and an alcove at the rear end is completely vitrified indicating the intense heat once achieved inside the kiln. A fill of burnt material was recorded in a section along the coast in front of the kiln entrance.

The excavation was hampered by the presence of World War II munitions in the upper fill of the kiln, as it had been re-used by an American soldier during the 1944 landing of Anzio. Munitions aside, we found instant coffee bags from Oklahoma, batteries, tins, shaving-cream, a spoon and other personal belongings near and in the alcove cut by the soldier into the rear wall of the kiln. The partial WW II destruction of the kiln wall is clearly visible in the upper part of the section, as a debris layer of kiln wall material (fig. 30, 31).

Two quadrants out of four were excavated after the site had been cleared of munitions by *artificieri* from the military base. No remains of an internal kiln plate were found, which would have been necessary for a pottery kiln type I (cf. Cuomo di Caprio 1985). Underneath the World War II level, the dune sand was almost sterile except for the base of a Roman amphora at a depth of 1.75 m, some fragments of Roman tiles and the base of a *terra sigillata* bowl somewhat lower down. In the vicinity of P 11 Roman shards and tiles were recovered, but no material from later periods. It must be assumed that the Roman shards only fell into the kiln after it had been abandoned, since no clear Roman stratum was recovered inside the kiln. A densely packed layer with furnace lining, burnt sand, chalk and tuff emerged at a depth of 180 cm. Powdery chalk aggregated towards the bottom of the kiln together with some partially concreted, fragmented shell material. Charcoal was found at a depth of 1.85 m, and was radiocarbon dated in Groningen: 1480 - 1960 AD (95.4% probability calibration (Oxcal v.3.5) of GrN-27342 = 240±50 BP). The few Roman shards found just above the charcoal must therefore have fallen down inside the kiln at a later stage. The charcoal was embedded



Fig. 31a-b. Sections P 11. Black spots are burnt tuff fragments and white spots are unburnt tuff fragments.

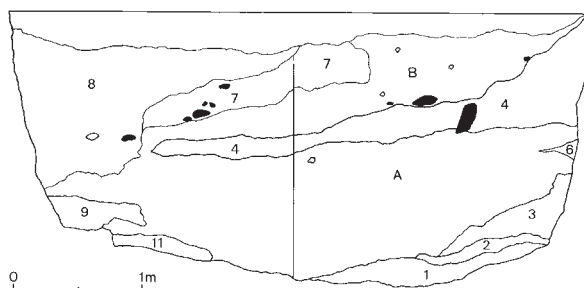


Fig. 31a. Section running east/west. A = dune sand; B = dune sand with some roots and tuff fragments; 1 = lime with charcoal and glazed tuff, colour 2.5Y 8/4; 2 = burnt sand, colour 10YR 5/6; 3 = burnt and unburnt tuff fragments, colour 10YR 5/6; 4 = burnt and unburnt tuff fragments, dune sand, glazed tuff, colour 2.5Y 5/4; 6 = burnt and unburnt tuff fragments, dune sand, glazed tuff, colour 10YR 5/3; 7 = burnt and unburnt tuff fragments, dune sand, glazed tuff, some lime, colour 7.5YR 4/4; 8 = burnt and unburnt tuff fragments, dune sand, glazed tuff, some lime, colour 2.5YR 5/4; 9 = glazed tuff and burnt sand, colour 2.5YR 5/3; 11 = glazed sand, lime and some glazed tuff, colour 7.5YR 8/2 and 10R 4/6.

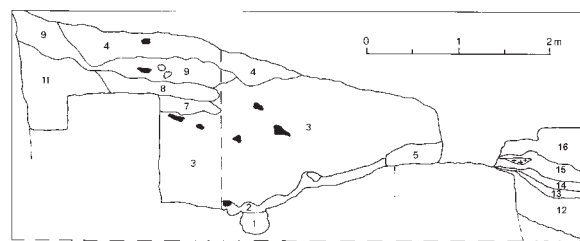


Fig. 31b. Section running north/south. 1 = sand and lime, colour 10YR 5/3; 2 = burnt and unburnt tuff fragments, dune sand, glazed tuff, lime, colour 2.5Y 5/4; 3 = sand with some burnt and unburnt tuff fragments, FeMn, burnt sand and roots, colour 10YR 5/6 and 10YR 5/3; 4 = burnt and unburnt tuff fragments, some roots, colour 2.5Y 5/3; 5 = burnt and unburnt tuff fragments, colour 10YR 4/3; 7 = sand with some unburnt and burnt tuff fragments, colour 10YR 4/6; 8 = sand with some roots, colour 10YR 4/4; 9 = sand with burnt and unburnt tuff fragments, some lime, glazed sand and roots, colour 2.5Y 4/4; 11 = burnt and some unburnt tuff fragments, burnt sand and roots, colour 2.5Y 4/4; 12 = large unburnt tuff fragments and rock fragments, colour 5Y 7/3; 13 = burnt sand, some recent charcoal and some unburnt tuff fragments, colour 7.5YR 5/4, 5YR 5/6 and 10R 4/4; 14 = burnt sand, some recent charcoal, unburnt tuff fragments and some FeMn, colour 7.5YR 5/4; 15 = burnt sand, some unburnt tuff, lime and recent charcoal, colour 5YR 5/6 and 10R 3/2; 16 = unburnt and some burnt tuff fragments, some lime, colour 10YR 5/4.

in a vitrified substance which also formed a layer at the bottom of the kiln, at a depth of 1.70 m near the kiln wall and of 1.85 m towards the centre of the kiln.

The stratum of lime and shells, in combination with the charcoal and vitrified substance, indicates that the kiln had been used for the production of lime not so long ago, possibly in the 18<sup>th</sup> or 19<sup>th</sup> century AD. The kiln structure itself is almost identical to that of a Roman lime-kiln described by Cato in the 2<sup>nd</sup> century BC (Adam 1994, 70). The method of lime production appears to have hardly changed in pre-industrial settings since antiquity.

## 6 SUMMARY

In this paper we have discussed three sites that furnish archaeological evidence for the exploitation of the coastal strip between Nettuno and Torre Astura in South Lazio between the Bronze Age and sub-recent times. Our work builds on the inventory of archaeological sites made by

Piccarreta in the 1970's as part of his topographical studies for the *Forma Italiae* series (Piccarreta 1977) and complements the work done recently by Alessandri on the protohistory of the coastal strip between Ostia and Formia (Alessandri 2000-2001).

Central to our studies on Bronze Age activities along the coast was the excavation of P 13, a single period site of which only a small part remains. The site's stratigraphy has revealed that the deposits are *in situ*; an interpretation that is supported by the well preserved and hardly abraded shards that were excavated and the considerable size of the fragments of those vessels that could be reconstructed. The majority of the fragments belong to large vessels while an almost negligible percentage belongs to tableware. The shards are found in association with tuff chunks often with burnt surfaces. The deposits from which the potshards are provenient do not contain any features and the shards and tuff chunks are therefore interpreted as refuse. The large size of the reconstructed vessels, and the fact that the shards were found stacked, point to a salt-working site. The

discolouration on some of the bases, in combination with the *briquetage* (large number of shattered vessels and the use of tuff chunks as supports for the vessels during the water evaporation process), strongly point to salt-making. A late Bronze Age date for P 13, based on the pottery typology, is confirmed by the <sup>14</sup>C dates. Several other exposures mapped by Piccarreta, Alessandri and ourselves indicate that P 13 is certainly not an isolated case. Salt production may have continued into the Archaic period along this coastal strip.

The area of Le Grottacce (P 15) shows evidence for Palaeolithic activities. Strata with late Bronze Age or early Iron Age impasto were mapped and partly excavated. It is possible that these remains represent a year-round settlement, but it might equally be a specialized industrial site like P 13. Excavations and subsequent analysis of the pottery assemblage could perhaps allow us to decide between these proposed interpretations.

Kiln remains and wasters of tiles indicate that pottery workshops were established both in the northern and in the southern part of the site in the late Republican period. The secondary deposits with amphora shards and the pits filled with shards (the 'amphora pockets') may be interpreted as the refuse of local amphora production. These contexts have yielded fragments of Graeco-Italic and Dressel 1A amphorae, but most shards belong to an unknown small amphora type with a knobbed base, a short neck with rounded handles and a thickened rim.

Sometime in the second half of the 1<sup>st</sup> century BC, a large *villa marittima* was established at Le Grottacce with its residential quarters to the south, a bath house and surrounding buildings in the central part and, to the north, an industrial area. The latter was constructed on a platform formed by the levelled remains of the northern pottery workshop. Whether industrial activity also continued on the south side of the site is uncertain. The large villa complex knew at least one phase of reconstruction, but neither this nor the phase of general decline can be dated for the moment.

Finally we documented a lime production kiln at Bottego (P 11), that appeared to have been in operation around 1800 AD, as revealed by radiocarbon dating of carbonized wood samples from the lower levels of the kiln. The kiln measured approximately 4.5 m in diameter and was excavated to a depth of 1.85 m. It is of a type that was already known in the Roman period in the 2<sup>nd</sup> century BC, but no clear evidence for an earlier use than that indicated by radiocarbon dating was found inside the kiln.

## NOTES

- <sup>1</sup> The final publication will appear in the journal of the Groningen Institute of Archaeology *Palaeohistoria* 45/46.
- <sup>2</sup> During the fieldwork in 2001, J. Maassen, M Rooke, O. Satijn, K. Seistrup and G. Tol assisted in cleaning and drawing the section; O. Satijn also assisted in mapping and sampling the various features and amphora pockets. M. Kramer drew some of the amphora shards. The authors would like to thank G. van Oortmerssen (RUG) for the fabric analysis and restoration of material, and P. Monsieur (Ghent University) for comments on the typology and dating of the amphorae.

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# The Nemrud Dağ Project: second interim report

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## Abstract

*The Second Campaign at Nemrud Dağ concentrated on the preparation and implementation of a restoration and conservation program. The sandstone slabs at the West Terrace had partly fallen down and all of them show severe damages on the relief surfaces. A snow fence was constructed at their backs that should prevent snow pulling down the remaining stelae. At the East Terrace we experimented hoisting the elements of the limestone colossal statues with a large professional crane. The heads of the five human figures and the four animals were placed in front of the statues as was done with some other fragments. We studied the possibility of stabilisation of the bases and the rocks underneath the statues. These results can be of great profit during the future campaigns that aim at a restabilisation of these statues. The archaeological work focused on the documentation (SIS) and interpretation. Furthermore epigraphic remains were studied with the help of a digital scanner. Artefacts from the monument were sampled and ceramic finds were analysed.*

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  - 2.1 West Terrace
  - 2.2 East Terrace
- 3 Archaeological Research
  - 3.1 The SIS (with Tesse D. Stek & Ellen Thiermann)
  - 3.2 Some New Observations
    - 3.2.1 The Remaining Rock Formations
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    - 3.2.4 The Lifting Holes (Tesse D. Stek & Miguel John Versluys)
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  - 3.5 Ceramological Investigations (Abraham van As)
- 4 Conservation and Restoration
  - 4.1 Remarks on the Structural Consolidation, Conservation, Reinforcement and Repair of the Colossal Statues (Predrag Gavrilovic)
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- 5 Outlook for the Coming Years

## 1 INTRODUCTION

In the 2002 campaign, the archaeological research begun in our first season (2001) was continued

and further developed.<sup>1</sup> We worked on the Site Information System (SIS) and, just as in the previous season, our documentation of the site generated new observations and ideas (see Sections 3.1 and 3.2). Our epigraphic team continued their research with the help of a digital scanner that gave new perspectives but also posed practical problems (see Section 3.3). New aspects of our archaeological research on Nemrud Dağ and its monuments are the study of the scarce ceramics found in the 2001 campaign and a plan to produce an inventory of artefacts from the monument dispersed over many Turkish and international museums (see Sections 3.4 and 3.5).

The 2002 campaign also saw the start of a structural engineering project and a stone conservation project. Both were undertaken in close co-operation with the World Monuments Fund (WMF). This part of our campaign required a major investment of time, money and working hours. As the restoration and conservation of Antiochos' monument is one of our project's main goals, however, we found it necessary to obtain as much information as possible from geologists, geophysicists, engineers and stone conservators. Some of their (preliminary) results are described in Section 4.2

During the first campaign in 2001 a meeting on the mountain had been organised at which representatives of the Turkish government, the WMF and our team discussed the outlines of the planned restoration and conservation work. A second meeting to formulate a more concrete pro-



gramme was held in Amsterdam's Allard Pierson Museum in November 2001, and a third meeting took place at Kahta and Nemrud Dağ on 14 July 2002. The goals and objectives formulated during the first two sessions were presented to the Turkish authorities, who gave permission for us to start the work on 3 June 2002. The campaign lasted until 27 July.<sup>3</sup>



*Fig. 1. The two dexiosis reliefs after falling down in the winter of 2001-2002 (photo: E.M. Moormann).*

## 2 SITE CONDITION AND SITE PROTECTION

### 2.1 West Terrace

During the severe winter of 2001-2002 several metres of snow covered the tumulus and the terraces. At the start of the thaw, masses of snow coming from the tumulus hit the rear of the series



*Fig. 2. The snow barrage under construction (photo: A. van As).*

*Fig. 3. The snow barrage (photo: A. van As).*

*Fig. 4. Preconservation of the Herakles dexiosis relief (photo: A. van As).*

of *dexiosis* reliefs and two of these - the *dexioseis* of the king with Zeus and with Kommagene - fell down (fig. 1).

The Zeus stela had first been restored from two pieces by Friedrich Karl Dörner in the early 1980s with iron pins and epoxy. These pins corroded and a second restoration was apparently carried out using a stainless-steel pin and epoxy. This is clear from the two different layers of epoxy. An unused hole next to one iron pin is from this second intervention. The break was mostly in the same place. Local workers maintained the pieces in horizontal order. We reinforced this construction by adding more stones.

The Kommagene stela shows many deep vertical and horizontal breaks over the whole rear. We could not see if the relief itself, already poorly preserved, had been damaged any further in the collapse.

The other reliefs were still standing, but it was clear that they had become more precarious: the modern Portland mortar at the bases of the slabs had split off, leaving cracks. Under the Lion Horoscope, two corroded iron pins, similar to the pins in the Zeus stela, are visible.

Immediate intervention seemed necessary. After a lengthy discussion with technical experts and representatives of the Ministry of Culture, we decided to leave the stelae as they are and install a snow barrage behind them (figs. 2-3). Some modest pre-conservation was done on the surfaces of the stelae that were still standing (fig. 4). Next year the reliefs will be removed to a provisional restoration house for more extensive treatment.

The debris caused by the former presence of Dörner's field station was cleared away. These stones were used to fill up the (artificial) part of the West Terrace behind the Greek ancestor stelae.

## 2.2 East Terrace

Research into the structural stabilisation of the colossal statues on the East Terrace has shown their instability.<sup>4</sup> To preserve them, they will need to be consolidated and, in some cases, restored. This also applies to the heads of the colossal statues that now lie scattered over the terrace where they are vulnerable to tourists and cannot be properly preserved.

There are two ways to arrive at such a consolidation: 1. *in situ* stabilisation, or 2. dismantling and rebuilding. The first option, *in situ* stabilisation, is obviously preferable for several reasons and is also in accordance with modern restoration ethics. Over the next few years, we will try to stabilise

(and restore) the colossal statues using a minimal intervention strategy. It still has to be decided whether or not to put the heads of the colossal statues back on top of their colossal bodies. During the 2002 campaign we prepared this project in two ways: 1. as a kind of pilot project we experimented with using a crane to move the heads of the colossal statues (fig. 6) and 2. we took some emergency



Fig. 5. The provisional routing system on the East Terrace (photo: A. van As).



Fig. 6. Transportation of the heads of the colossal statues with the crane (photo S. Ateşoğulları).

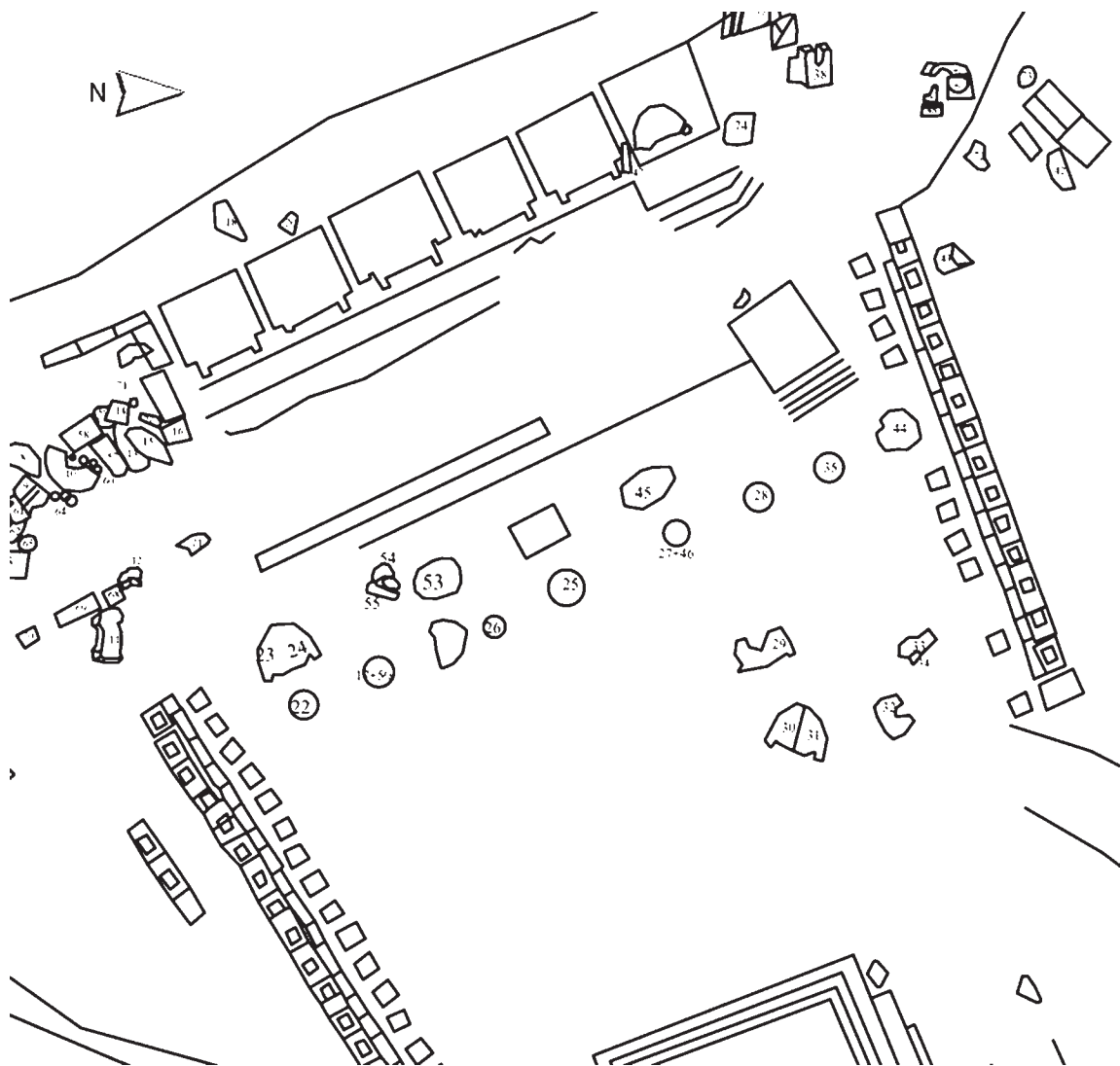


Fig. 7. The East Terrace: situation at the end of the season (27 July 2003) (drawing by T. D. Stek).

measures with regard to parts of statues that needed to be consolidated as soon as possible. As a result of these interventions the situation on the East Terrace is now quite different from the previous state of affairs (fig. 7). In this regard it is important to realise that the East Terrace (and also, for that matter, the West Terrace) did not show the *in situ* situation as discovered by Theresa Goell in the 1950s.<sup>5</sup> Figure 7 shows the new situation with the heads of the statues in front and the shoulder-piece of Apollo (no 45) removed from its dangerous position.

Regarding the figure of Kommagene the main purpose was to gather the damaged fragments that were still lying behind the statue and on top of the fourth layer. The head, the monolithic

shoulder-piece split into two huge fragments, and one fragment of the fifth layer (the right arm and flank) were placed on the terrace in front of the statue. One piece belonging to the fourth layer was too fragile to be hoisted and is still lying behind the statue.

The head of Antiochos, standing next to the Kommagene head, was also transported to the terrace. It consists of the head and a loose tiara, joined by means of a tap under the tiara. The two were joined without the use of any material. A circular cavity had been hollowed out in the bottom of the head. A rectangular channel shows that lead needed to be inserted to increase the head's stability (fig. 8).



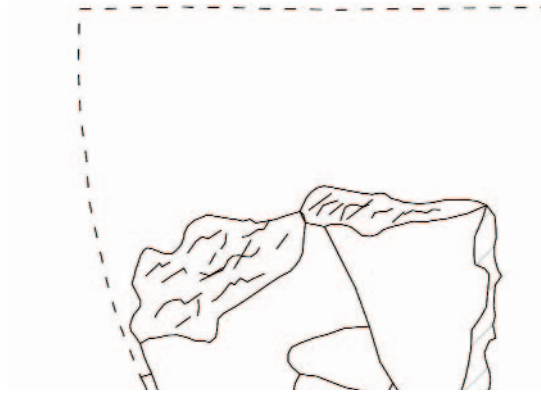


Fig. 8. East Terrace, head of Antiochos, bottom with circular cavity (photo: A. van As).



Fig. 9. East Terrace, head of Herakles, tap (photo: A. van As).



Fig. 10. East Terrace, the cavity under the footstool of Herakles filled up with stones (photo S. Ateşoğulları).



Fig. 11. Galvanised iron ring (photo S. Ateşoğulları).

The heads of both eagles, Zeus, Apollo and Herakles - already located on the terrace - have been reset on layers of gravel in a ring of metal. The head of the northern lion was hoisted from its offside position beyond the row of stelae and placed in front of its original position. It could be established that the heads of Kommagene, Herakles and Apollo had a tap under the neck for insertion, whereas those of both eagles have a flat bottom and the lion and Antiochos are hollowed out (fig. 8-9). The lower half of the head of Zeus is missing.

Stabilisation of the bedrock under the statues is necessary because of the brittleness of this limestone. The two pairs of animals at the north and the south edges have already been lost because of this. We hope to be able to protect these parts of the rock in one of the next campaigns. For now we have limited this aspect of the work to filling a cavity under Herakles' footstool. The damage here may have seemed slight, but in fact the large

footstool block was only resting on its right side. Seismic activities or any kind of slight movement could have destabilised the entire statue. We therefore filled the hollow space with natural materials present on the site. No mortar or epoxy was needed (fig. 10).

In order to exhibit the heads well and safely in front of the statues, we prepared bases made of galvanised iron rings filled with stones (fig. 11). These supports serve to stabilise the heads and prevent contact with plants growing on the terrace. Obviously this operation is completely reversible. The transportation of the heads and other parts by means of a crane proved to be rather easy, safe and, moreover, very precise. Soft bands of cloth were wrapped around the pieces in order to hoist them (figs 6, 12-13). This operation also enabled us to establish the weight of some of the heads and some other parts of the colossal statues (table 1). Lastly a provisional routing system was made (fig. 5).



Statue	Weight of piece in kg
A: eagle, south side (head)	3,600
C: Antiochos (head)	2,000
C: Antiochos (tiara)	1,000
D: Kommagene (head)	4,200
D: Kommagene (shoulder)	1,200
D: Kommagene (polos)	600
E: Zeus (head)	4,000
F: Apollo (shoulder)	4,300
H: lion, north side (head)	4,200

Table 1. The weight of different parts of the colossal statues.

### 3 ARCHAEOLOGICAL RESEARCH

As most attention was paid to the conservation and restoration program, little research was done. This will remain the case through the coming years, as

the poor state of conservation of the monument demands that we concentrate on protecting it. The pilot survey started last year continued, but on such a modest scale that we will publish its results in one of the subsequent interim reports, in combination with the results of the intervening years.

#### 3.1 The SIS (with Tesse D. Stek & Ellen Thiermann)

Relatively little work was done on the SIS this year. The drawing team continued work on the detailed map of the East Terrace, corresponding to Level 2 in the SIS.<sup>6</sup> In compiling this map, the GPS data provided by the Technical University Delft served as the point of departure. Figure 14 shows part of the East Terrace map documenting the situation before blocks were moved. We took additional photos of single blocks (Level 5) and especially of the sandstone fragments of the guardian animals lying on both terraces. Some examples of the digitalised drawings of Level 6, the block drawings of colossal statues, are given in figures 15 and 16. Figure 15 shows the blocks



Fig. 12. East Terrace, head of Kommagene being lifted (photo: A. van As).



Fig. 13. East Terrace, head of Antiochos being lifted (photo: A. van As).

that have been identified as pertaining to the north Lion at the East Terrace (ET Statue I), whereas Figure 16 shows the polos of Kommagene, the shoulderpiece of Apollo and a fragment of the tiara and head of Zeus, all on the East Terrace. Generally, we observed in respect to the previous year considerable changes in the location of some elements, particularly fragments of sandstone slabs.

### 3.2 Some New Observations

#### 3.2.1 The Remaining Rock Formations

The small hill at the south side of the West Terrace had been studied during the campaign of 2001. Possible traces of the layout of two square rooms or man-made open spaces were registered on the southern side. It is therefore clear that some sort of human activity has been present at this spot. Unfortunately no finds in the form of pottery sherds or other objects have been made on which to base a speculative dating of these human activities. One possibility is a 'site office' for the workers who constructed Nemrud Dağ's monuments, but that seems less plausible than the option that these remains date from an unknown time before that period. The most southern element consists of a small band only and one would fall off if stepping onto it. The wall of rock shows traces of cutting and brittling of the limestone and it seems clear that the constructors of the tumulus took

material from this side, as they did from other places. That would mean that the room in question has been 'eaten away' by the stone cutters and/or erosion.

This leads to the hypothesis that the rock in this area served as a quarry for material to form the tumulus. One might even argue that the intention was the complete removal of this rock - as in the adjoining areas nearer to the terrace itself. The remains, in that case, should be seen as an extra argument in favour of the idea that the monument was never completed. The *terminus ante quem* for the structural remains on top of the rock, therefore, is the erection of the colossi at the West Terrace.<sup>7</sup>

The same reasoning could be applied to a much smaller piece of rock located west of the North Terrace, beside the path leading to the West Terrace. Furthermore, the presence of this worked rock formation seems illogical and can only be explained as an element that was marked for removal. In general, however, the presence of natural elements seems not to have disturbed the builders of the monument. As already observed by us and others, the natural setting plays a large role in the conception of the *hierothesion* and perhaps these elements - likely to disturb this concept according to a Graeco-Roman view - were not seen as such at all. The small hill next to the West Terrace did not block the view for visitors on the processional road from Arsameia; they could see the statues and the tumulus from afar.

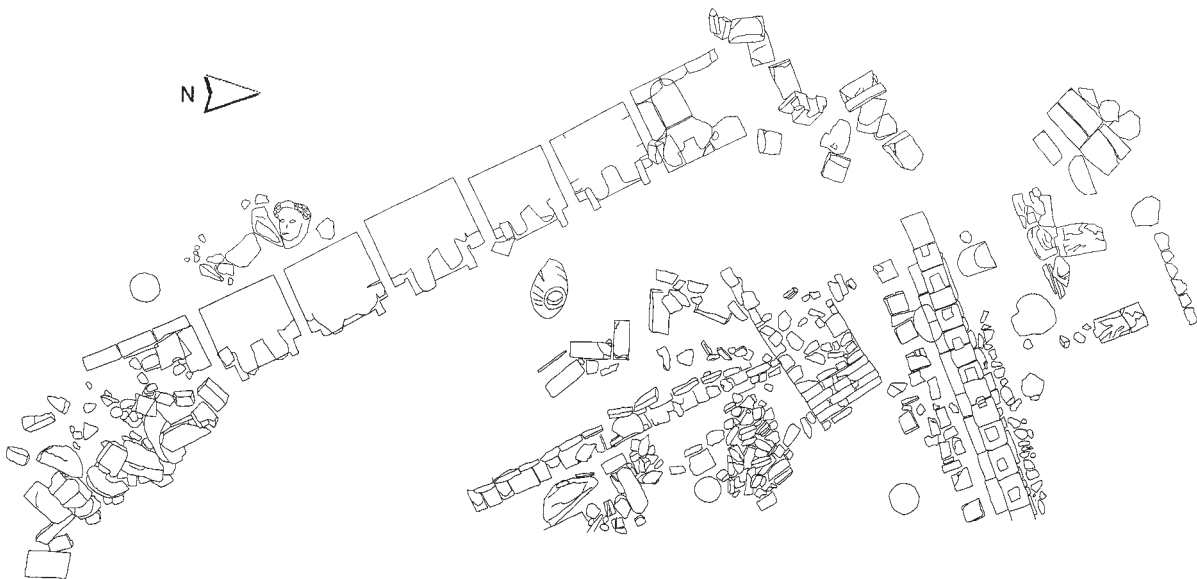


Fig. 14. East Terrace, digitalised plan (drawing T.D. Stek and E. Thiermann; digitalisation J. Venneman).



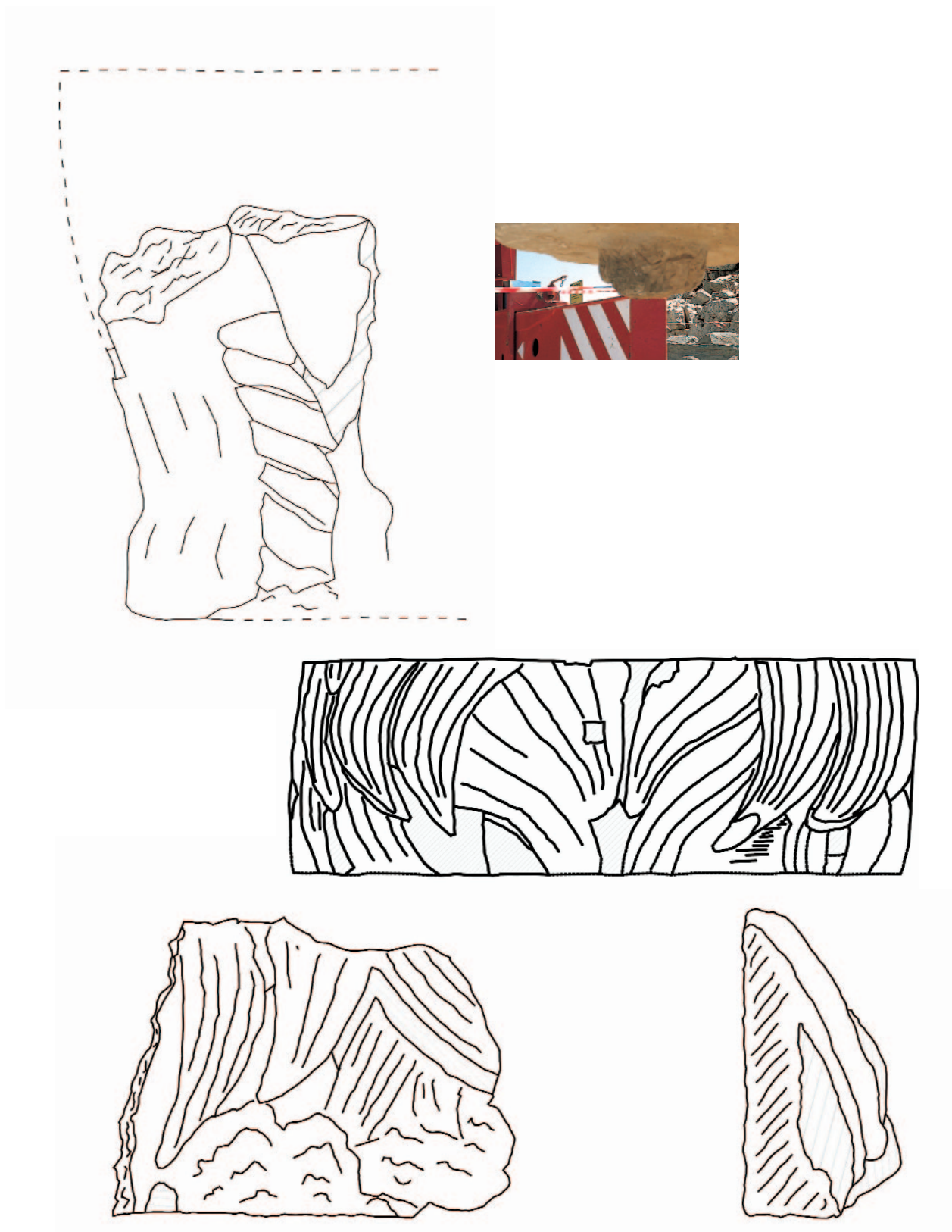


Fig. 15. East Terrace, northern lion, block drawings (SIS level 6)  
(drawings T.D. Stek and E. Thiermann; digitalisation J. Venneman).

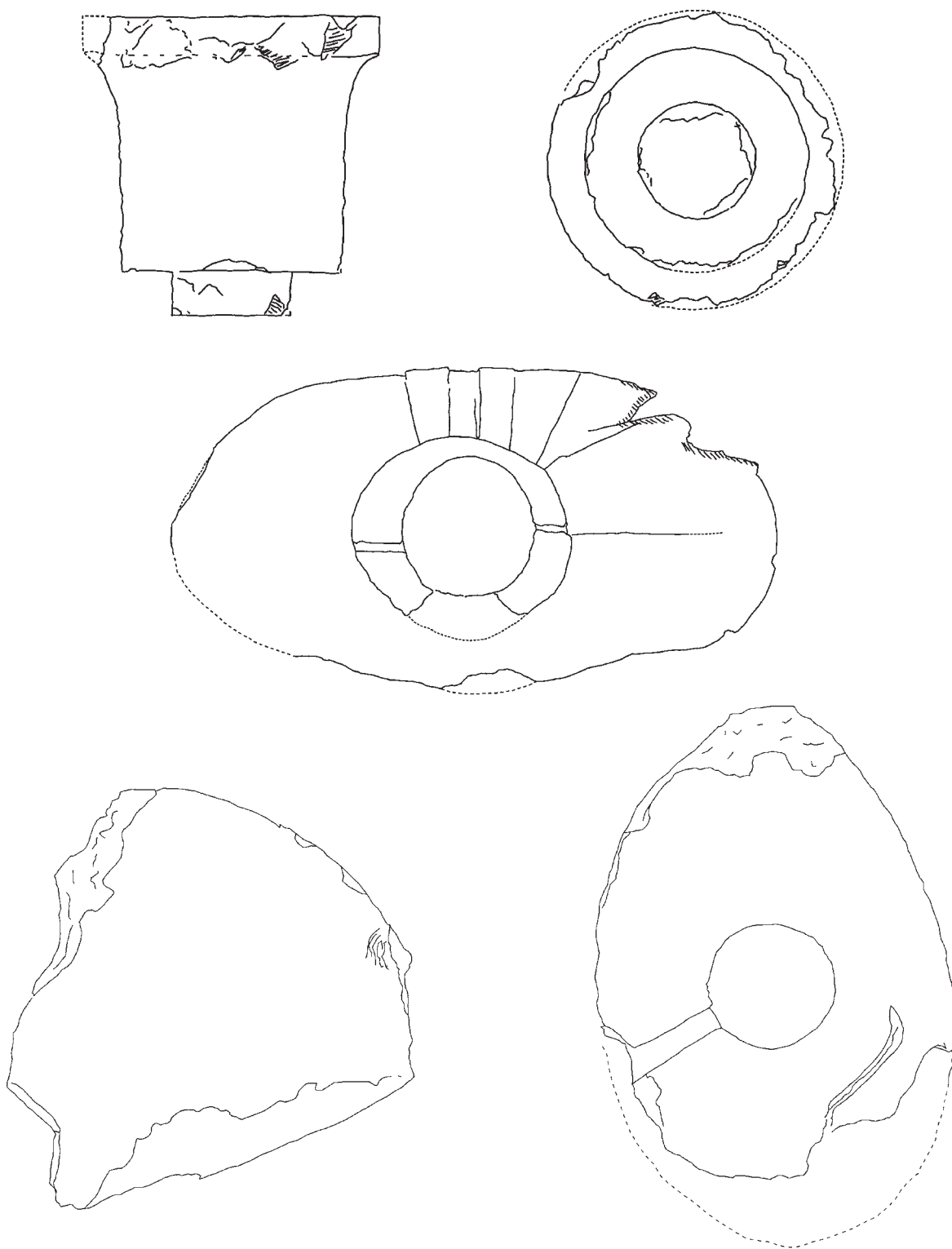


Fig. 16. East terrace, polos of Kommagene, shoulderpiece of Apollo and fragment of tiara and head of Zeus (drawings T.D. Stek and E. Thiermann; digitalisation J. Venneman).



### 3.2.2 Architectural Elements on the East Terrace (Tesse D. Stek & Miguel John Versluys)

During our work on the East Terrace we cleared some of the debris lying on the East Terrace podium structure. In this process we were able to distinguish some of the sockets for the stelae that Goell had hypothesised on this podium structure. The stelae's sockets are neither equal nor set in one straight line. Combined with the find of fragments of stelae by Goell, the presence of reliefs in this place is beyond doubt. We must, however, be careful to reconstruct a 'wall' of stelae that would have completely hidden the worked rock rising behind the small steps in front of the feet of the colossi. Sanders' reconstruction of the lower podium as a two-stepped structure seems correct. Above this rises a much less regular podium, partly natural, partly worked, where stelae were placed on suitable locations. If we assume that these stelae had the same height as those on the West Terrace, viz. the top of the stelae, as seen from the terrace, would have been in line with the rock-cut podium in front of the colossi.

In front of the podium structure, Goell reconstructed a sacrificial block altar and a 'basin'. Old photographs show that the present situation in the field does not differ much from the situation revealed to Goell after she had cleared the terrace. We see no reason to reconstruct, with Goell, a 'sacrificial block altar', let alone a 'basin' (?).<sup>8</sup> What we do need to reconstruct in this place, however, remains unclear. Sanders' suggestion that the altar structure would be secondary is indeed plausible; however, one wonders why (and how), shepherds would have lifted these very large slabs to make a fireplace. Moreover, the presence of an altar in front of the stelae on the podium is not illogical: a comparison can be drawn to other (ancestor) reliefs with altars standing in front of them. And although we do not understand the suggestion of a 'basin', there are, as a matter of fact, a relatively large number of tuffit stones lying in a regular line in that spot (fig. 17).

### 3.2.3 The Tumulus

Tumuli are a common form of grand-style burial monument throughout the Mediterranean.<sup>9</sup> As such, there is nothing strange about the concept of a tumulus at Nemrud Dağ. However, two elements are peculiar: 1. the position of the tumulus on top of a mountain that originally had a more or less conical form, and 2. the technique used.

As to 1. we do not know of any parallel exam-



Fig. 17. East Terrace, podium structure  
(photo: M.J. Versluys).



Fig. 18. East terrace, statue of Antiochus, lifting hole  
(photo: E.M. Moormann).

ples. One may, however, surmise that the idea of a 'peak sanctuary', a common sort of monuments in the Near East and in the Minoan and Mycenaean civilisations, served as a source of inspiration. In this respect, the tumulus is not so much the tomb, but a religious centre, something which is also expressed in the great inscription on the back of the colossal statues.

As to 2. we stress on the peculiarity of the gravel layer on top of the especially worked mountain.<sup>10</sup> This gravel layer could be an imitation of the tumuli in Gordion in central Asia Minor. These Phrygian tombs date to the period of splendour of this kingdom, viz. the 8<sup>th</sup>-7<sup>th</sup> centuries BC, and consist of tomb chambers constructed in timber and covered with thick layers of gravel, pro-

ducing artificial, conical hills.<sup>11</sup> Machteld Mellink has briefly considered the tradition of large tumuli of great kings in Asia Minor: Midas in Gordion, Alyattes at Sardis - only known for certain from Herodotus' description (*Historiae* 1.93), but often identified as the big tumulus at Bin Tepe near Sardis - and Antiochos I on top of Nemrud Dağ.<sup>12</sup>

One of the most famous kings of central Anatolia was Midas, who Alexander the Great honoured during his famous visit to Gordion in 333 BC. By untieing the 'Gordian knot', he concreted the *mythos* that 'anyone who untied the knot of the yoke would rule Asia'.<sup>13</sup>

Although Nemrud Dağ is far away and a much later construction than the tumuli of Gordion, we want to suggest that the connection Antiochos-Alexander-Midas can be taken into account, when looking for the sources of inspiration of the king of Kommagene. Especially the relationship with Alexander, included in the series of ancestors by the kings of Kommagene, could illustrate this point. We also know that Alexander had great plans to build a large tomb for his father in the form of a pyramid.<sup>14</sup>

Another parallel, of a tumulus surrounded by statuary, chronologically closer to Nemrud Dağ is known from a description by Flavius Josephus, viz. the tomb that the Maccabean King Simon (143/2-135 BC) erected for his brother Jonathan in Modin, Palestine.<sup>15</sup> From this passage we can conclude that the grand monument could be seen from afar and that, like other Hellenistic tombs, it had a strong dynastic character.<sup>16</sup> In several aspects the monument thus resembles Antiochos' creation. A large difference, of course, is the (building) style of the monument: Simon's monument was distinctly Greek with its white marble and surrounding porticoes and monolithic pillars. Pillars can also be found at Karakuş, the burial place of the women of the Kommagenean royal family.

From these two short notes we may conclude that the entire concept of the tumulus at Nemrud Dağ combines two notions: that of an old-fashioned peak sanctuary and that of a dynastic funerary monument, assembling old forms and rather new Hellenistic dynastic concepts.

#### 3.2.4 The Lifting Holes (Tesse D. Stek & Miguel John Versluys)

Observations on the techniques used in building (or re-building) the colossal statues may have important consequences for the interpretation of the site. A considerable number of the blocks of the statues that have fallen down show holes

(generally 3 to 5 per block, approximately 6.0 x 5.5 cm, 8 cm deep; see figure 18). So far these have been most plausibly interpreted as having been used to lift the blocks during the construction or re-construction of the monument.<sup>17</sup> This applies to both the West Terrace and the East Terrace. In fact, from all the blocks *ex situ* on the East Terrace that could reasonably be taken into account (some blocks' positions or state of preservation did not allow determination in this respect), 51 in total, around 30 have lifting holes. On the West Terrace, where the statues have collapsed almost entirely and many more blocks have come down, 30 out of 102 determinable blocks show this feature, but determination was much more difficult here due to the state of preservation of the blocks.

A more detailed inquiry into the position of the blocks with lifting holes within the statues is presented here. Subsequently, possible implications for the interpretation of the monument are explored.

#### East Terrace

Figure 19 shows a schematic front view of how the colossal statues would have looked when finished.<sup>18</sup> All statues are built up in six to eight courses, which we have called Layer 1-8. The layers coloured in pink contain blocks with lifting holes. Yellow indicates layers with blocks where the presence or absence of lifting holes could not be determined because of their state of preservation or position in the field. Blocks in transparent layers did not appear to have had lifting holes. For example, the Layers 2, 3 and 4 of Lion A contain blocks with lifting holes, and although it seems highly probable that Layer 5 and 6 did as well, analogous with Lion I, we are not able to establish this with certainty as the head is entirely lost and layer 5 is not clearly visible. Eagle B appears to have lifting holes from Layer 3 up. As far as the statues of the gods are concerned, all heads have lifting holes, whereas the shoulder parts do not all show lifting holes. In addition, like the southern pair, the northern Eagle and Lion (statue H: Layer 4, 5 and 6 and Statue I: Layer 3, 4, 5 and 6) show more layers that contain blocks with lifting holes.

Figure 20 shows the situation as documented in photos from 1956, before the head and shoulder-piece of Kommagene came down in the early 1960s. The layers that came down during a collapse in the period between Antiquity and the re-discovery of the monument in the late nineteenth century, resulting in the 1956 situation, are coloured turquoise. Some blocks that are (or at least were in 1956) still *in situ* show lifting holes. We may

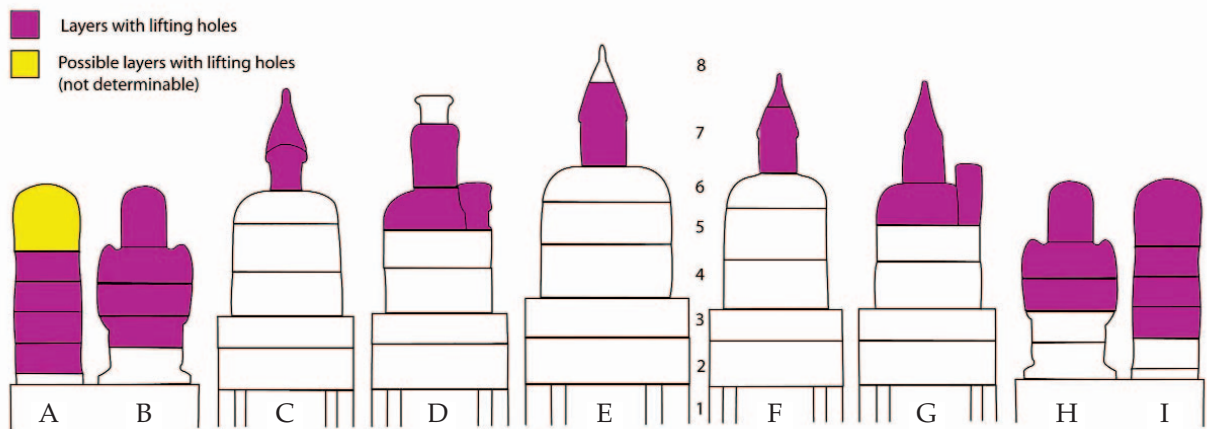


Fig. 19 Reconstruction of East Terrace showing presence of lifting holes per layer (drawing by T.D. Stek).

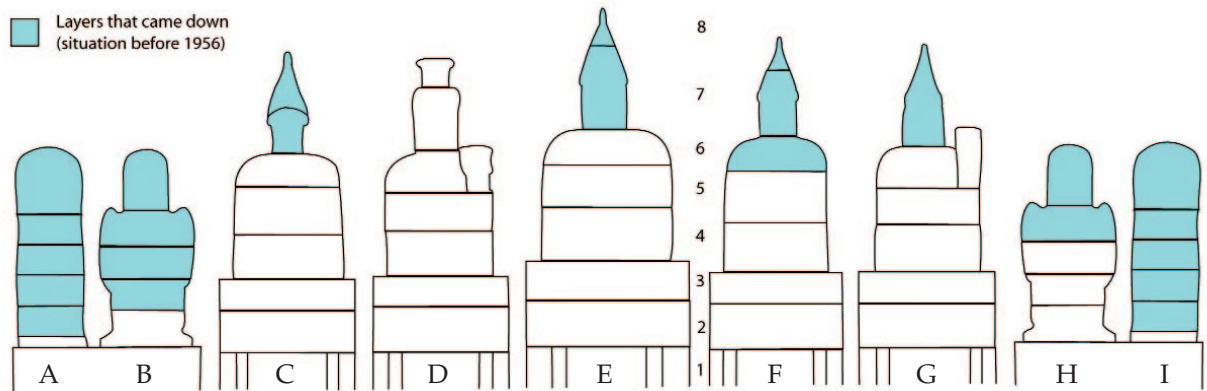


Fig. 20. Reconstruction of East Terrace showing results of collapse, situation before 1956 (drawing by T.D. Stek).

conclude therefore that the holes have been used to hoist these pieces in place. Comparing the blocks that show lifting holes (fig. 19, pink) and the blocks that came down later (fig. 20, turquoise), some resemblance can be noted. The 'peripheral' layers (the outermost statues of lion and eagle, the 'extremities' of the statues of the gods) are likely to both containing lifting holes and collapsing, which suggests a relation of some kind.

#### West Terrace

Understanding the use of lifting holes in the (re-)construction of the colossal statues on the West Terrace is hampered by both the comparatively bad state of preservation and the disorderly position of the blocks that have fallen down. The indications given in figure 21, a reconstruction with layers containing lifting holes coloured pink, must therefore remain partly conjectural. However, with these reservations in mind, we may still be able to discern the same pattern as shown on the

East Terrace. Again the upper layers have holes to make lifting possible, with the main difference that many more layers seem to have lifting holes, which corresponds, unsurprisingly perhaps, with the results of the collapse of the statues of the West Terrace which has led to the present situation (fig. 22, collapsed layers in turquoise). This collapse was much more drastic than on the East Terrace (cf. figs. 20 and 22).

#### Conclusions

These observations seem to corroborate the theory of a re-erection of the statues after a partial collapse, using lifting holes to hoist the fallen blocks back in place. According to this cautious hypothesis, at least two collapses in the history of the monument can be proposed. The most plausible cause of both collapses seems to have been seismic activity, as will be argued later. The strongest evidence for this theory seems to be the irregular use of the lifting holes, and the correspondence with the results of the proposed secondary collapse.



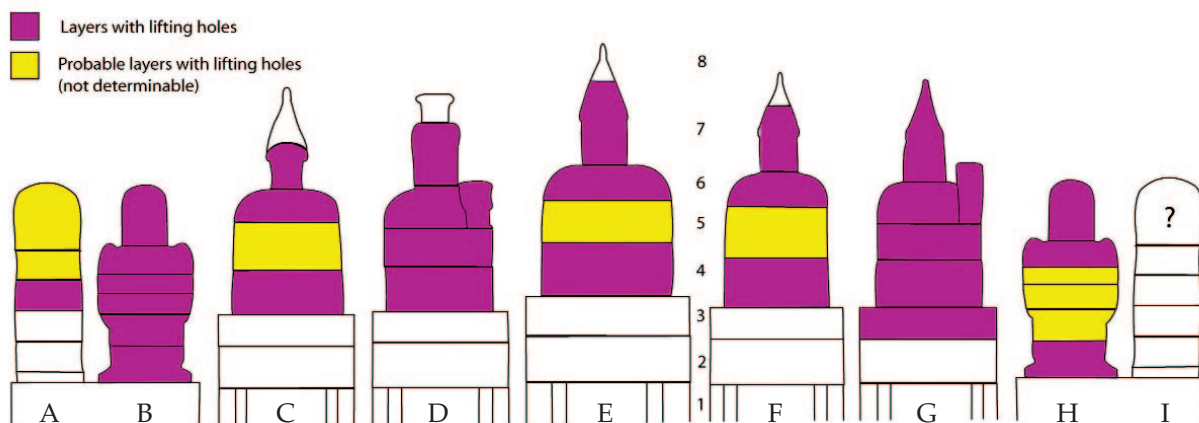


Fig. 21. Reconstruction of West Terrace showing presence of lifting holes per layer (drawing by T.D. Stek).

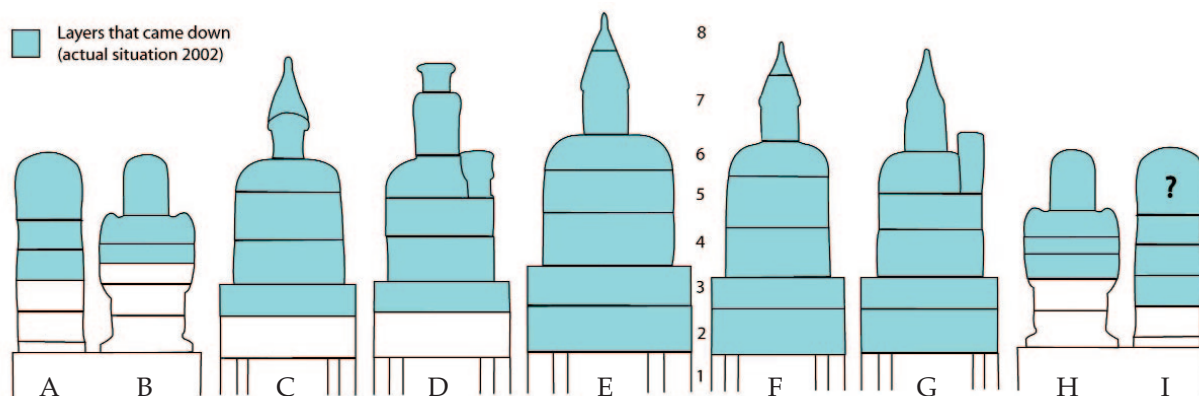


Fig. 22. Reconstruction of West Terrace showing results of collapse, actual situation (drawing by T.D. Stek).

First, we will have to consider the previous explanation proposed by Goell, who assumed that the heads show lifting holes because of technical reasons: according to her, the heads were completed on the ground and hoisted onto the shoulders, while the rest of the statue may have been carved in place.<sup>19</sup> The same reasoning could in fact apply to the presence of lifting holes in the shoulder-pieces of Herakles and Kommagene, in contrast with the other statues (cf. fig. 23, showing the shoulder-piece of Herakles, and fig. 24, showing the shoulder-piece of Kommagene). As these blocks seem to have been more elaborate, with Herakles' club and Kommagene's cornucopia, one could have decided to first carve these pieces - like the heads - on the terrace, then place them by hoisting. However, this theory does not explain 1. the situation on the West Terrace, where the statues' less elaborate layers also show lifting holes, and, sticking to the East Terrace, 2. the presence of lifting holes in almost all layers of the eagle and lion statues on the East Terrace, which,

apart from the head and maybe the breast blocks with the lion's mane (Layer 4 and 5), do not appear to have been any more elaborate than the other structural elements of the colossal statues. One could, in the case of the lion and eagle statues on the East Terrace, also propose that different building techniques were needed according to the conditions of the terrain, as the animal statues stand on the edges of the terrace. This remains a possibility, but does not help to explain the variability in the use of lifting holes (e.g. cf. fig. 20: Eagle B, with lifting holes in Layers 3 to 6; Eagle H, lifting holes in Layers 4 to 6), and it is not quite clear why there should have been so much use of lifting holes at the relatively easily accessible West Terrace.

There is an alternative explanation: the correspondence between the damage that occurred in a later period (the secondary collapse proposed here, resulting in the modern situation, figs. 20, 22) and the presence of lifting holes (fig. 19, 21) points to a structural cause for the collapse of just



these blocks. As for the heads and shoulder-pieces, this can be explained easily by the heightened vulnerability of the extremities of the statues, or the effect of amplified acceleration if we consider earthquake as the possible cause of collapse.<sup>20</sup> As for the lion and eagle statues, they stand on a shared base that was most endangered by destabilisation and erosion because of its location on the edge of the statues' natural socle. Structural differences between East and West Terraces might also be due to the almost complete collapse of the statues on the West Terrace, whereas the East Terrace remained partly intact.<sup>21</sup> Considering the arguments presented above, the general similarity between the effects of the proposed first collapse, resulting in the reconstruction of the statues using lifting holes, and the second collapse, leading to the actual situation, point to the same cause of collapse. This seems to support the hypothesis of seismic activity causing the statues' fall.

The main question that rises from this hypothesis concerns the date of the proposed reconstruction. Similar lifting holes are found in building elements at slightly later Kommagenean sites such as Karakuş.<sup>22</sup>

At the site of Direk Kale, about thirty kilometres from Nemrud Dağ, the ruins of three Roman temples are visible. On the hilltop directly above this complex (the so-called Mill's Mountain, named after a windmill that apparently stood there until the 1960s), with a great view of Nemrud Dağ itself, the ruins of a sanctuary were found.<sup>23</sup> Hoepfner traces the sanctuary on the basis of a small decorative relief fragment back to the Kommagenean period. The architectural elements, however, may also belong to the Roman period, as the Greek inscriptions found on several pieces seem to indicate (fig. 25).<sup>24</sup> Some blocks on the hilltop site show lifting holes similar to those found at Nemrud Dağ, but it seems impossible to establish whether these elements belong to the (proposed) Kommagenean building phase, or to the period of the Roman sanctuary (fig. 26). In this case, as at Karakuş, it is hard to say whether the lifting holes were made in the primary construction process, or date from later restoration. It is possible that the use of lifting holes was a Kommagenean practice and was used in the primary construction of Karakuş and Direk Kale, if we accept a Kommagenean phase for the hilltop sanctuary. The proposed reconstruction of the monument on Nemrud Dağ could then, therefore, have taken place in the Kommagenean period itself. However, if we were able to date the use of

lifting holes (or the sanctuary as a whole) at Direk Kale to the Roman period, which at present does not seem totally unfounded, it would be tempting to date all drilling of lifting holes at the different sites to the same period.<sup>25</sup> One could then hypothesise something of a general (re-)building programme, in which the 'traditional Kommagenean' sacred landscape was reconstructed and re-emphasised, perhaps even in order to express a local Kommagenean identity in a changed world after the Roman conquest. This interpretation has to remain very preliminary though, as not all sites, in particular Direk Kale, have yet been studied in detail.



Fig. 23. East Terrace, shoulder piece of Herakles (photo: T.D. Stek).



Fig. 24. East Terrace, shoulder piece of Kommagene (photo: T.D. Stek).

### 3.3 Epigraphic Research (Onno van Nijf & Frits Steenhuisen)

During the 2002 campaign our team worked from 4 to 20 June.<sup>26</sup> The main aims for this campaign were to complete the photographic and topographic documentation of the inscribed surfaces on Nemrud Dağ itself, and to identify epigraphic material from the site in the museums of Adiyaman and Gaziantep. A secondary aim was to explore the area surrounding Nemrud Dağ, in order to identify sites of (potential) epigraphic interest.

We have completed our photographic documentation of the inscriptions that are still present on Nemrud Dağ with the exception of the remains of the northern parodos inscription (currently lying upside down near the north parodos, see *fig. 1*), and fragments reportedly in the care of the

site attendant. This year we also experimented with recording texts using a Minolta High Definition non-contact 3D scanner placed at our disposal by the Groningen Institute of Archaeology. Our aim was to make detailed scans of the ‘palimpsest’ inscriptions on the backs of the stelae on the West Terrace, which are very hard to read due to erasure in Antiquity and climatic influences. The purpose of the scans was to make a detailed 3D record, in order to preserve the current state of the stelae. We expect that the 3D images can be digitally enhanced to increase legibility.

On our arrival it appeared that a number of stelae on the West Terrace had toppled over because of heavy snow in the winter (see Section 2; *fig. 1*) and some of these were in a precarious position. It was too dangerous to make scans of these slabs. We concentrated our efforts on the



*Fig. 25. Hill-top sanctuary of Direk Kale, block with Greek inscription (photo: T.D. Stek).*



*Fig. 26. Block at hill-top sanctuary of Direk Kale showing lifting holes (photo: T.D. Stek).*



*Fig. 27. The late Huib Waterbolck operating the scanner in the makeshift tent (photo: F. Steenhuisen).*



stelae that were still standing. The Minolta VI-900 non-contact scanner uses a laser to determine the surface topography and simultaneously measure the colour (RGB) of each measuring point in order to create a texture. Per scan we recorded approximately 300,000 measuring points. The scanner was set at a distance of about 1 metre from each stone so that we could scan a large number of small segments of approximately 20 x 20 cm. These segments were later digitally processed and joined together.

Initially there were some technical problems to be solved. The sensors did not cope well with the high concentrations of scattered UV and IR in the light at this altitude. A major problem was caused by reflections from the light-coloured limestone. We avoided this problem by using a makeshift tent, which blocked enough of the incoming light (fig. 27). We are now working on a more permanent solution by using special filters and providing effective shielding from direct sunlight.

We have processed the scans by means of the software package RapidForm and joined the individual scans, per stele (fig. 28). The next step is to render the topography of the stelae in the form of a TIN raster (triangular irregular network) and read the data into the GIS. In this way we hope to develop a model for pattern recognition. After our return Huib Waterbolk and Frits Steenhuisen began processing the data, but there has been a considerable delay due to the illness and subsequent death of Waterbolk.

We were not able to study the inscribed material in the museums of Adıyaman and Gaziantep because of the late arrival of our permit. We were able, however, to explore some sites in the area surrounding Nemrud Dağ - i.e. Karakuş, Gerger (ancient Arsameia ad Euphratem), Bazık and Direk Kale - and have identified a number of promising sites. We especially hope to be able to extend our research to the site of Direk Kale in the years to come.

### 3.4 Dispersion of Artefacts from Nemrud Dağ

All of the scholars who have worked on the site of Nemrud Dağ in the past have collected pieces of stone and sculpture that were lying around the site in order to protect and study this material. This was done on a very modest scale by the earliest explorers and on a far greater scale by Theresa Goell, Friedrich Karl Dörner and, lastly, Bruno Jacobs. As a result many fragments and parts of stelae and ancestor reliefs are now dispersed over Turkish and international museums. More than a

century after the discovery of the site, there is no overview of 'what is where', although it is clear that the bulk of material should still be in the storerooms of the museum of Adıyaman.<sup>27</sup>

For two reasons, we intend to produce an inventory that is as complete as possible in subsequent campaigns: first of all, to complete our documentation, and secondly, for practical reasons. To restore the reliefs we need to know exactly which missing pieces of a specific relief have been preserved and can be integrated with the relief. To start this project we began an inventory of the bulk of material in the storeroom of the Adıyaman museum. In the next years we will describe, photograph and identify all larger pieces.

### 3.5 Ceramological Investigations (Abraham van As)

When asked to participate in the Nemrud Dağ Project for two weeks in July 2002 as an expert in the field of archaeological/technological ceramic research, I reacted with scepticism as no pottery whatsoever had been found during earlier archaeological research: neither on the platforms of the Nemrud Dağ nor on the mountainside. It thus seemed rather unlikely that the 49 sherds collected during the 2001 campaign, found in four concentrations on the mountainside, were of Kommagenean origin. If they are of Kommagenean origin, the sherds, now in the Adıyaman Archaeological Museum, might provide new conclusions on the function and chronology of the monument.<sup>28</sup> For this reason a short visit seemed justified. At the same time, field walking could enable me to judge for myself whether a more intensive archaeological survey on the slopes of the Nemrud Dağ would be worth initiating in the near future. This report on my experiences contains: 1. description and dating of the sherds collected on the slope of Nemrud Dağ 2. results of field walking; and 3. conclusions.

### Description and Dating of the Pottery Fragments Found in 2001

#### Concentration 05

Concentration 05 includes 15 small body sherds (max. length between 1.5 and 4 cm) of handmade pottery, amongst which one fragment with a carinated profile. The thickness of the sherds varies between 0.6 to 1.3 cm. As most of the sherds are heavily eroded, the mineral inclusions are often visible on the rough surface. Only in some cases can the original more or less smooth surface be observed. The colour of the inside, outside, and

core of the sherds varies between light reddish-brown (5YR6/4), reddish-brown (5YR5/4), light brown (7.5YR6/4), and reddish-yellow (5YR6/8). This indicates that the pottery was fired in a neutral till oxidising atmosphere. Furthermore, Concentration 05 includes one small rim fragment (max. length 4 cm; thickness 1.3 cm) of a small jar or jug probably made on the potter's wheel and fired in a neutral/oxidizing atmosphere.

#### *Concentration 09*

Concentration 09 includes seven small body sherds (max. length between 1.7 and 6 cm) of handmade pottery and one body sherd of wheel-made pottery (throwing ridge visible on the inside). The thickness of the sherds varies between 0.3 and 0.9 cm. As in Concentration 05 most sherds were heavily eroded. The mineral inclusions are clearly visible. The handmade pottery was mainly fired in a neutral atmosphere (pink: 7.5YR7/4), the wheelmade vessel in an oxidizing atmosphere (red: 2.5YR6/6).

#### *Concentration 17*

Concentration 17 includes 25 sherds, one of which is a rim fragment of a wheelmade jar. The shoulder shows the place where the broken handle was originally attached to the jar. The reddish yellow colour (7.5YR7/6) indicates an oxidizing/neutral firing atmosphere. The remaining 24 sherds of concentration 17 include 16 small body sherds (max. length 2-8 cm; thickness 0.6-1.2 cm) of probably handmade pottery. Again, these are heavily eroded sherds of mineral tempered ware in colours varying between weak red (2.5YR5/4), light brown (7.5YR6/4), reddish yellow (7.5YR7/6), and pink (7.5YR7/4). Finally concentration 17 includes 9 sherds of green glazed ware.

#### *Concentration 18*

Concentration 18 includes one fragment of a flat base (diameter 11.5 cm) together with two body sherds of the same type of remarkably high-fired pottery. The throwing ridge on the inside of the base is clearly visible. The original glaze has almost disappeared due to post-depositional processes.

#### *Dating*

Unfortunately the surface finds described above cannot provide new conclusions regarding the function and chronology of the monument. Most of the sherds are not diagnostic. The glazed sherds found in concentrations 17 and 18 can be dated to the Byzantine/Arabic period. The body sherds of the handmade pottery cannot be dated. The sur-

face finds found so far do not include fragments of Hellenistic pottery comparable with contemporary pottery from Arsameia.<sup>29</sup> There does not seem to be any direct relationship between the 49 pottery sherds found on the slope of the Nemrud Dağ and human activities on top of the mountain during the first century BC.

#### *Field Walking*

During field walking trips on the high stony slopes of the Nemrud Dağ, at most covered with shrub, no further pottery was found. It was like looking for a needle in a haystack. The discovery of the sherds described above seems to be something of a minor miracle. The presence of pottery sherds at this altitude without any permanent habitation might indicate the use of pottery by passing herdsmen.



Fig. 28. Digital scan of one of the stelae (photo: F. Steenhuisen).



### Conclusion

The pottery sherds found in 2001 on the slope of the Nemrud Dağ are not Kommagenean. No more sherds were found during field walking. Hence, further archaeological survey seems useless with respect to the aims of the Nemrud Dağ Project.

## 4 RESEARCH ON CONSERVATION AND RESTORATION

This year our work mainly concentrated on the preparation of plans for the conservation and restoration of the monument. Despite its impressive dimensions and striking appearance it is in great danger of collapse and lacks stability. The main goals to be achieved relate to the preservation of the fragile sandstone reliefs, especially those standing on the West Terrace, and the consolidation of the colossal statues on the East Terrace. We did not, however, succeed in realising all proposed items and hope to build on the experiences acquired during the 2002 campaign in further work on those items in the near future (see Section 5). The next two sections present the results of two aspects of the technical research that also seem directly relevant to archaeologists.<sup>30</sup>

### 4.1 *Remarks on the Structural Consolidation, Conservation, Reinforcement and Repair of the Colossal Statues (Predrag Gavrilovic)*

The colossal statues on the East and West Terrace have the same structural system and almost identical proportions. This principal structural system is composed of dry-stone masonry consisting of large blocks of yellowish-white limestone, constructed in horizontal rows with joints. The connection between the heads of the statues and the lower massive structure is by 'shear key', whereas the remaining connections between the blocks, including the connections of the heads of the eagles and the lions, are direct. The foundation rests directly upon the surface layer of the bedrock. The structure of the statues itself consists of three parts: 1. base (throne), placed directly on bedrock (representing disintegrated rock mass composed of limestone), 2. body of the statue and 3. head of the statue connected to its body by 'shear key' connection. The structure and the structural system of the sculptures of the eagles and the lions is basically the same, the difference being that both sculptures are constructed on a common platform and that the heads are not connected to the lower massive structure.

It should be pointed out that, from a building

point of view, the structures of the sculptures on the East and the West Terraces are not identical although their outward appearance and proportions are. The statues on the East Terrace are composed of massive, large blocks with smaller inner openings, filled with small stones in the lower part and specially shaped in the upper part. The statues on the West Terrace, on the other hand, consist of smaller stone blocks with larger inner openings in the lower part (the pedestal), and are placed on variable and non-uniform soil conditions, with weaker characteristics and pronounced erosion. The different structure and the weaker characteristics of the main material (limestone), as well as the inconsistency in foundation point to the possibility that these structures were not constructed at the same time and might not be the work of the same masters.

From the analysis of the structural system, the materials used and the present condition of parts of the collapsed statues (i.e. the extent of damage), and taking into account the regional conditions (seismicity), the local conditions (soil and mode of foundation), as well as the climatic conditions and the period of construction, the following conclusions can be drawn.

- 1 These monuments have undoubtedly been exposed to strong earthquakes in the past which is one of the reasons for their collapse on the West Terrace, and severe damage and partial collapse on the East Terrace. The fact that the heads of the statues are displaced from the original position indicates that these statues have experienced an 'overturning' effect as a result of amplified acceleration at the top of a rigid body. This can be proved by an analytical model and a dynamic response analysis.
- 2 The second decisive factor for the extent of the damage was the local conditions and the erosion of the surface rock on which the structures are directly placed. This is particularly applicable to the West Terrace, the slopes on the North Terrace and the south side of the East Terrace.
- 3 The severe climatic conditions (cold winters and hot dry summers) over the course of more than two thousand years have contributed to an extensive deterioration of both the blocks of the structural system and the surface layer of the soil (rock). This has caused a modification of the main characteristics of soil and erosion, creating conditions for a relative displacement and deformations with separation of the rigid structure up to a total collapse.

The interactive effect of these three factors is the main reason for the collapse and the damage of the sculptures on Nemrud Dağ.

It can be concluded that the structures of the sculptures, although constructed of massive large blocks and dry masonry, possessed extensive lateral seismic resistance. The fact that the head of the Kommagene statue on the East Terrace was still in its original position in 1962 indicates that the statue was able to resist the effect of earthquakes for two thousand years. This proves the thesis of the interactive effect of a number of factors and can only be explained in that way.

As far as the East Terrace is concerned, it is generally noticeable that almost all of the statues possess their original form, with a small number of missing or broken blocks. Nonetheless, they have all suffered damage and displacement of stone blocks, and require consolidation.

Regarding the statue of Herakles, the following can be observed: the base and the second part of the statue are in a stable condition, i.e. in the condition of a generally preserved original form. The damages to the stone structure, particularly at the front, are extensive and due to erosion and damage to the base (cf. *figs. 10, 23*). The erosion and deterioration of the bedrock at the front have been the main causes of the damage incurred, along with other natural phenomena and effects. There is damage to individual stones in the upper part and disturbed structure-soil contact where a stone block has turned into a beam due to erosion and deterioration, representing a potential threat of complete, progressive collapse of the entire statue (cf. *figs. 10, 23*).

The statue of Zeus is generally in the same condition as the Herakles, with a visible dislocation of a block in the second tier and occurrence of vertical separations. This indicates initial 'general instability' that has resulted also in crushing of the stone blocks in the lower rows.

Based on an analysis of the state of the Kommagene statue some thirty to forty years ago, when the head was still in its original position, and also considering the remains for the type of failure, we may conclude with a significant degree of certainty that failure has occurred for reasons that are different from those affecting the other statues. The crushed stone from the blocks and the head indicates a direct influence or a natural phenomenon, i.e., lightning or the hand of man.

The statue of Antiochos provides insight into the collapse mechanism of stone structures constructed of dry masonry consisting of vertical separations: cracks as a consequence of changes

in the base resulting in 'structural instability'. As far as structural stability is concerned, this statue is in the worst condition: urgent measures for its consolidation are necessary to avoid collapse.

On the northern side, the base of the lion and the eagle is partially broken. The base of the lion is ruined, whereas the part with the figure of the eagle is in good condition (the base and the body of the animal), the head of the lion being on the plateau. All the stones forming the base of the eagle are present and undamaged, as collapse must be relatively recent. The south base with the figures of the lion and the eagle is even more ruined than the northern set of animals.

Regarding structural consolidation and based on the analysis of the existing state of the sculptures the following conclusions can be drawn.

- 1 All five sculptures are in a condition requiring necessary structural consolidation.
- 2 Structural consolidation can be done without compromising the authenticity of the monument by not using concrete, mortar or other materials.
- 3 The structural consolidation of the Antiochos statue should be done immediately. If more time is needed for an intervention, temporary measures should be carried out first.
- 4 The base of the lion and the eagle on the northern side can be successfully reconstructed by consolidation of the existing part and rebuilding the statues. Conditions that allow the figures of the eagle and the lion to be replaced in their original positions must be created.

#### 4.2 Diagnosis of Weathering Damage (Bernd Fitzner, Kurt Heinrichs & Dennis La Bouchardiere)

Stone monuments represent an important part of our world's cultural heritage.<sup>31</sup> The awareness of increasing stone damage on monuments and the danger of irretrievable loss of cultural heritage has resulted in great efforts worldwide for monument preservation. A precise damage diagnosis is required for the comprehensive classification, interpretation and rating of stone damage. It is fundamental for the decision, planning, execution and control of appropriate monument preservation measures.

In 1988 the Aachen working group *Natural Stones and Weathering* carried out the first studies on the Nemrud Dağ monuments aimed at diagnosis of weathering damage and contribution to sustainable monument preservation.<sup>32</sup> Infor-

Survey, photo documentation and classification of weathering forms according to type and intensity	Stelae, sculptures, dimension stones	West Terrace, North Terrace and East Terrace
Comparison of visible weathering damage 1988/2002		
Monument mapping - precise registration and documentation of weathering forms	Lion horoscope King - Apollo - Stela King - Herakles - Stela Xerxes I - Stela	West Terrace West Terrace West Terrace West Terrace
Ultrasonic measurements	Lion horoscope King - Apollo - Stela	West Terrace West Terrace
Survey on variability of the sandstones		
Sampling for laboratory analyses		

Table 2. Studies of sandstone monuments - Nemrud Dağ Working program - field campaign 2002.

mation and documents obtained from these studies were compiled as the basis for the 2002 field campaign on the Nemrud Dağ.

Within the framework of the 2002 field campaign, damage diagnosis was continued on behalf of the World Monuments Fund, and in close interdisciplinary cooperation with the other Nemrud Dağ Project partners. The studies focused mainly on the sandstones used in the Nemrud Dağ monuments (fig. 29-37). Additionally, at the request of the project management, preliminary studies on limestone statues were carried out.

The investigation of the sandstone monuments comprised the survey of weathering forms, monument mapping, ultrasonic measurements and the survey of lithotypes, including sampling (table 2).

Weathering forms represent the phenomenological response of natural stones to weathering processes which are initiated and controlled by weathering factors. They are used for the precise description of weathering phenomena on stone monuments. The objective and reproducible registration and documentation of weathering forms require a standardised classification scheme. Such a classification scheme of weathering forms was developed by the Aachen working group *Natural Stones and Weathering*, based on the investigation of stone monuments worldwide considering different stone types and environments.<sup>33</sup>

A detailed survey of the weathering forms on the sandstone monuments of the Nemrud Dağ was made considering type and range of intensity. Stelae, sculptures and dimension stones of the West Terrace, North Terrace and East Terrace were surveyed. At the same time, the types and

intensities of the weathering forms were compared with those observed in 1988 on these monuments (fig. 29). This allows the characterisation and quantification of weathering progression within the period of fourteen years. This evaluation represents an important contribution to weathering prognosis, risk estimation and to decisions on the necessity and urgency of monument preservation measures.



Fig. 29. North Terrace, survey of weathering forms on sandstone reliefs (photo: B. Fitzner).





Fig. 30. West Terrace, Lion horoscope  
(photo: K. Heinrichs).

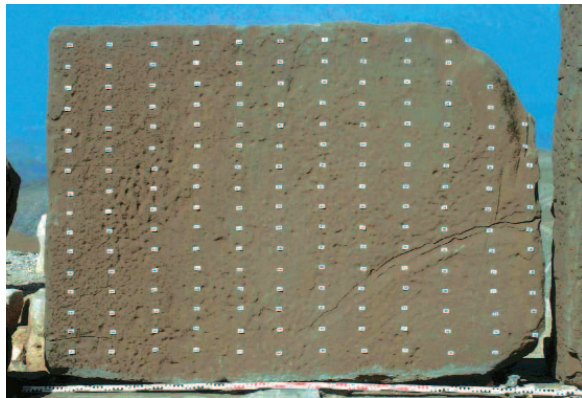


Fig. 33. West Terrace, Lion horoscope, grid for ultrasonic measurements, back side (photo: K. Heinrichs).



Fig. 31. West Terrace, Lion horoscope, arrangement of the grid for ultrasonic measurements (photo: K. Heinrichs).



Fig. 34. West Terrace, Lion horoscope, ultrasonic measurements (photo: E.M. Moormann).

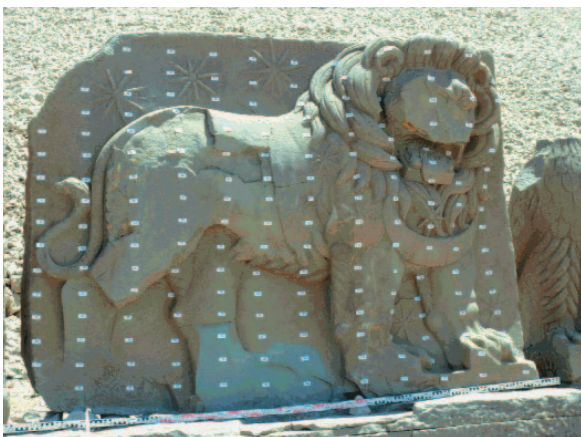


Fig. 32. West Terrace, Lion horoscope, grid for ultrasonic measurements, front side (photo: K. Heinrichs).

Based on the systematic survey of the weathering forms, the available standard classification scheme of weathering forms was tailored to optimal applicability for the sandstone monuments of the Nemrud Dağ. The optimisation of the classification scheme has included a suitable intensity classification of the weathering forms.

Based on this classification scheme, the monument mapping method was applied for the precise registration, documentation and evaluation of weathering forms on different sandstone stelae, with special reference to those studied in 1988. The mapping method - developed by the Aachen working group - represents a non-destructive, well-established procedure which allows the quantitative evaluation of entire stone surfaces according to type, intensity and distribution of weathering forms. It makes an important contribution to rating weathering damage, weathering prognosis and to information on causes and processes of stone weathering.



Steps of computer-enhanced evaluation are:

- illustration of the weathering forms in maps,
- quantitative evaluation of the weathering forms,
- deduction of information on sequences of weathering forms,
- rating of weathering damage by means of damage categories and damage indices.

The use of damage categories and damage indices for the rating of weathering damage on stone monuments is described in Fitzner/Heinrichs 2002 and in Fitzner/Heinrichs/La Bouchardiere 2002. The application is demonstrated by means of case studies. Results obtained from monument mapping will be compared with those gathered from the studies in 1988.

Ultrasonic measurements were carried out on the Lion horoscope and the Apollo dexiosis relief (figs. 30-36). Results of ultrasonic measurements are important for the supplementation and quan-

tification of findings from the phenomenological investigation. Furthermore, pre-macroscopic stone weathering can also be detected. Grids for the non-destructive ultrasonic measurements were arranged on the front side of the stelae and then transferred to the corresponding rear section. The measuring distances were determined. The ultrasonic measurements were made according to the transmission mode.

Steps of evaluation are:

- calculation of ultrasonic velocities from transit time and measuring distance,
- illustration of the ultrasonic velocities in maps by means of isolines,
- rating of weathering damage,
- risk prognosis.

Studies on the variability of the sandstones (colour, grain size, structure etc.) followed the survey and mapping of weathering forms and the *in situ* measurements. Based on this survey of the sand-



Fig. 35. West Terrace, Apollo dexiosis, ultrasonic measurements (photo: K. Heinrichs).

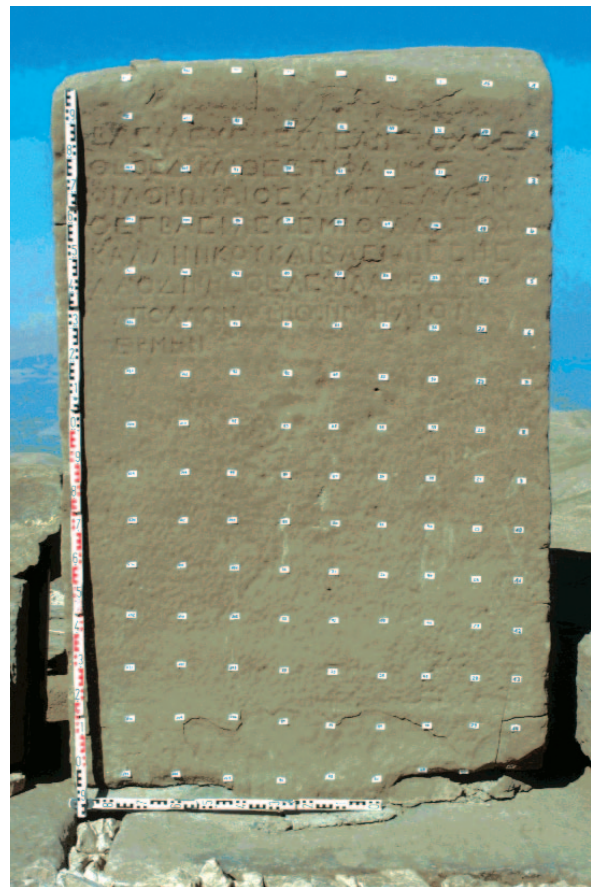


Fig. 36. West Terrace, Apollo dexiosis, grid for ultrasonic measurements, back side (photo: K. Heinrichs).

stones, representative samples were collected (fig. 37) with the permission of the responsible Turkish authorities for the analyses of the petrographical properties of the sandstones, including macroscopic characteristics, mineralogical-geochemical properties, structural and textural properties, porosity properties, hygric properties, petrophysical properties.

All studies on the sandstones within the framework of the 2002 field campaign were accompanied by a systematic photo documentation.

The pilot studies on limestone monuments of the Nemrud Dağ are listed in table 3.

The ultrasonic measurements on the head of Apollo (West Terrace) are shown in figures 38-41. The measurements were made by means of the refraction mode and focused on quantitative information about main cracks. The ultrasonic measurements on the head of the eagle H (East Terrace) were made according to the transmission mode in order to obtain detailed quantitative information on the state of weathering (fig. 42).

Pilot profile measurements were carried out as a first contribution to a systematic characterization and classification of microkarst forms on the statues (figs. 43-44).

## 5 OUTLOOK FOR THE NEXT YEARS

Concerning the protection and conservation of the site we have developed two plans to be executed in the next years. One focuses on the tuffit elements on all three terraces, the other regards the colossal statues on the East Terrace.

All tuffit elements are in a very poor state and in need of protection, conservation and restora-



Fig. 37. Kurt Heinrichs sampling pieces of sandstone (photo: B. Fitzner).

tion. The decay of the reliefs is most clear, of course, in the Lion horoscope and the *dexiosis* stelae on the West Terrace. However on this terrace and on both the other terraces (East Terrace and North Terrace) more sculptured tuffit elements are now deteriorating rapidly: ancestor and/or other reliefs and guardian animals. We therefore intend to move them to an on-site restoration studio where they will be conserved and restored. After this they should be exhibited in a (future) site museum, while plaster copies should be placed in their original positions.

As already explained above (see Section 2) research on the structural consolidation of the colossal statues on the East Terrace has shown their instability. This necessitates a project of stabilisation and reconstruction beginning as soon as possible. Structural consolidation, repair, reinforcement and reconstruction must be done with due respect for international conservation stan-

First survey and photo documentation of weathering forms	Statues	West Terrace and East Terrace
Preliminary mapping of weathering forms	Head of northern eagle	East Terrace
Pilot ultrasonic measurements	Head of Antiochos	West Terrace
	Head of Herakles	West Terrace
	Head of Zeus	West Terrace
	Head of Kommagene	West Terrace
Systematic ultrasonic measurements	Head of Apollo (cracks)	West Terrace
	Head of northern eagle	East Terrace
Profile measurements (microkarst)	Statues	West Terrace and East Terrace
Preliminary sampling for laboratory analyses		

Table 3. Pilot studies on limestone monuments - Nemrud Dağ Working program - field campaign 2002.





Fig. 38. West Terrace, head of Apollo, limestone (photo: K. Heinrichs).



Fig. 39. West Terrace, head of Apollo, survey of fissures (photo: K. Heinrichs).



Fig. 40. West Terrace, head of Apollo, grid for ultrasonic measurements (photo: K. Heinrichs).

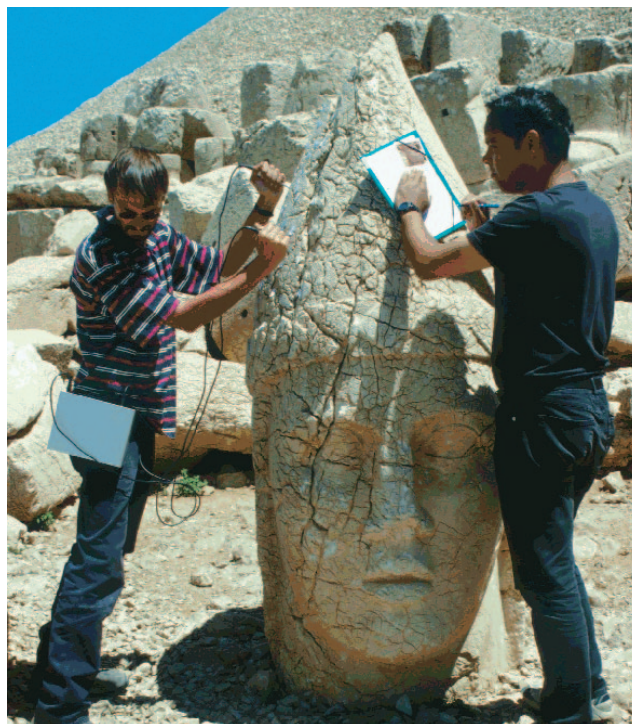


Fig. 41. West Terrace, head of Apollo, ultrasonic measurements (photo: B. Fitzner).





Fig. 42. East Terrace, head of northern eagle, limestone, ultrasonic measurements (photo: B. Fitzner).



Fig. 43. Profile measurements, microkarst (photo: B. Fitzner).

dards. 'Minimum intervention, maximal protection' can be seen as our main rule. This implies that nothing will be altered in the existing situation unless such an intervention is absolutely necessary for the protection of the monument. We intend to protect the monument by conservation and restoration, but do not intend to rebuild all the statues. Nemrud Dağ must remain an *archaeological site*, but a documented, restored and protected one.

Besides these restoration activities, archaeological research will be carried out. This research primarily aims at an inventory and documentation of the remains on and from Nemrud Dağ.

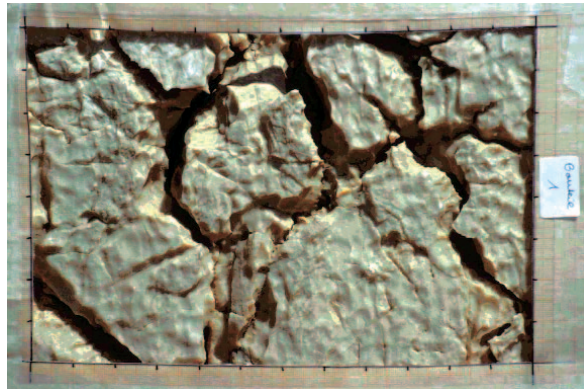


Fig. 44. Studies on microkarst, reference areas (photo: K. Heinrichs).

#### NOTES

- <sup>1</sup> Abbreviations: Hoepfner 1966=Hoepfner, W. 1966, *Direk Kale. Ein unbekanntes Heiligtum in Kommagene, IstMitt* 16, 157-177; Moormann/Versluys 2002=Moormann, E.M. - Versluys, M.J. 2002, *The Nemrud Dağ Project: first interim report, BABesch* 77, 73-111; Sanders 1996=Sanders, D.H. (ed.) 1996, *Nemrud Dağı. The Hierothesion of Antiochos I of Commagene. Results of the American Excavations directed by Theresa B. Goell*, I (text), II (illustrations), Indiana. The English text was corrected by D. Colmer.
- <sup>2</sup> For the goals and results of this work see also the internal reports *World Monuments Fund: First technical mission, August 2001* and *World Monuments Fund: Nemrud Dağ, Adıyaman, Turkey. 2002 final field mission report. Pilot conservation and mobilization project*.
- <sup>3</sup> Composition of the UvA-INF-WMF team: Herman A.G. Brijder and Eric M. Moormann, project managers, Miguel John Versluys, acting project manager, Tesse D. Stek and Ellen Thiermann, Site Information System, all University of Amsterdam; Onno M. van Nijf and Marlies Schipperheijn, epigraphists, Frits Steenhuisen and † Huibrecht J. Waterbolk, documentation inscriptions, all University of Groningen; Anne ten Brink, prehistorian, Maurice L.A. Crijns, project coordinator,

Jaap Groot, constructing engineer, Ömer Yörükoğlu, structural engineer, all International Nemrud Foundation. Composition of the WMF team: Mark Weber (technical director WMF); Emine N. Çaner-Saltık, Evin Erder Ayse Tavukcuoğlu, Tamer Topal, Ahmet Turer, all Middle East Technical University Ankara; A. Elena Charola, University of Pennsylvania; Bernd Fitzner, Kurt Heinrichs, Dennis La Bouchardiere, all Rheinisch-Westfälische Technische Hochschule Aachen; Predrag Gavrilovic, St. Cyrillus and Methodius University Skopje; Paolo Pagnin, Venice. Soner Ateşoğulları (Museum of Anatolian Civilisations) and Latif Özen (Museum of Anatolian Civilisations) acted as representatives Ministry of Culture of Turkey. We would like to thank the Turkish Ministry of Culture for their kind cooperation, especially Alpay Pasinli for his commitment to the project. Also the help of Halil Işık, governor of the province of Adıyaman, is acknowledged with gratitude. Financial support for the 2002 campaign was provided by the International Nemrud Foundation and the World Monuments Fund. ENKA (Istanbul) kindly put at our disposal the crane and its operators.

- <sup>4</sup> See the WMF reports mentioned in n. 2, especially the contributions by P. Gavrilovic.



- <sup>5</sup> Cf. Moormann/Versluys 2002, 76 with n. 10.
- <sup>6</sup> Cf. Moormann/Versluys 2002, 93.
- <sup>7</sup> Cf. Moormann/Versluys 2002, 102.
- <sup>8</sup> Cf. Moormann/Versluys 2002, 101.
- <sup>9</sup> See most recently *Der Neue Pauly* 12/1 (2002) 907-918, 912 for Nemrud Dağ specifically.
- <sup>10</sup> Cf. Moormann/Versluys 2002, 100 and n. 66.
- <sup>11</sup> On the tumuli of Gordion see extensively Young, R.S. 1981, *Gordion I. Three Great Early Tumuli*, Philadelphia. The 'King's Tumulus' (MM) is the biggest one (53 m high, 300 m diam. (p. 79-190).
- <sup>12</sup> Mellink M. 1991, The Tumulus of Nemrud Dağ and its Place in the Anatolian Tradition, in *Studien zum antiken Kleinasien. Friedrich Karl Dörner zum 80. Geburtstag gewidmet*, Bonn (= Asia Minor Studien 3), 7-10, esp. 8. She points to the combination of (smaller) tumuli and statuary in Karaburun/Elmalı and Iziktepe/Güre. Young 1981 (o.c. n. 11), 79 refers to Alyattes' tumulus, but not to that of Nemrud Dağ.
- <sup>13</sup> Arrianus, *Anabasis Alexandrou* 2.3.7 (translation cited: Brunt P. 1978, *Arrian*, I, Cambridge Mass. (= Loeb Classical Library), 131). Here he only realises a λῶσις, in Quintus Curtius 3.1.14-19 and Justinus 11.7 he cuts it, whereas Plutarch in his vita of Alexander (18) follows Arrian.
- <sup>14</sup> Diodorus 13.4.5: not exactly a pyramid but similar τάφον πυραμίδι παραλήσων.
- <sup>15</sup> Flavius Josephus, *Antiquitates Judaicae* 13.211-212. Translation: Marcus, R. 1966, *Josephus*, VII, Cambridge Mass. (= Loeb Classical Library), 331: 'And Simon also built for his father and brothers a very great monument of polished white marble, and raising it to a great and conspicuous height, made porticoes round it, and erected monolithic pillars, a wonderful thing to see. In addition to these he built for his parents and his brothers seven pyramids, one for each, so made as to excite wonder by their seize and beauty; and these have been preserved to this day. Such was the zeal which we know to have been shown by Simon in burying Jonathan and building monuments to his family.'
- <sup>16</sup> Sartre, M. 2001, *D'Alexandre à Zénobie. Histoire du Levant antique. IV<sup>e</sup> siècle av. J.-C. - III<sup>e</sup> siècle ap. J.C.*, Paris, 405.
- <sup>17</sup> Cf. Moormann/Versluys 2002, 93.
- <sup>18</sup> All drawings by Tesse D. Stek after those by G.R.H. Wright from 1953, cf. Sanders 1996, plate 87.
- <sup>19</sup> T. Goell with additional notes from J.H. Young, compiled by D.H. Sanders, cf. Sanders 1996, 101.
- <sup>20</sup> Cf. Section 4.1.
- <sup>21</sup> Cf. Section 4.1. At present we will not explore the possibility that these structural differences between the East and West Terrace may point to a chronological difference, in which case the hypothesis presented here is to be revised.
- <sup>22</sup> Cf. Moormann/Versluys 2002, 93 for the possibility that the use of lifting holes is a Kommagenean practice.
- <sup>23</sup> The only extant publication on the site is Hoepfner 1966.
- <sup>24</sup> Hoepfner 1966, 161. F.K. Dörner dated the epigraphical style of the inscriptions in the second century AD (in Hoepfner 1966, 162). On a block that apparently had been turned over by local inhabitants our team noticed in July 2002 an inscription reading ΦΛΑΟΥΙ, maybe referring to a Flavius and, according to our epigraphist Onno van Nijf, dating to the Roman period.
- <sup>25</sup> A secondary date (after the Roman period) cannot be excluded as we have no *terminus ante quem*, although for historical reasons this does not seem very likely.
- <sup>26</sup> The members of the Groningen team wish to express their gratitude to the Groningen Institute of Archaeology, which put a Minolta VI-900 scanner at our disposal, and have made the time available for † Huib Waterbolk and Frits Steenhuisen to come to Nemrud Dağ, and to the N.V. Nederlandse Gasunie, Groningen, who have made a generous contribution towards our travel expenses.
- <sup>27</sup> Sanders 1996, 482-483 only gives a very general and incomplete overview of the dispersion of the artefacts from Nemrud Dağ (as he himself is well aware).
- <sup>28</sup> Cf. Moormann/Versluys 2002, 104-106.
- <sup>29</sup> For the Arsameia excavations cf. Dörner, F.K. - Goell, T. 1963, *Arsameia am Nymphaios. Die Ausgrabungen im Hierotheseion des Königs Mithridates Kallinikos 1953-1956*, Tübingen, and Hoepfner, W. 1983, *Das Hierotheseion des Königs Mithridates I. Kallinikos von Kommagene nach den Ausgrabungen von 1963 bis 1967*, Tübingen.
- <sup>30</sup> For more detailed and further information we refer to the reports listed in n. 2.
- <sup>31</sup> Geological Institute, /Aachen University, Germany. Working group *Natural stones and weathering*. Abbreviations used in this section: Fitzner/Düppenbecker 1991= Fitzner, B. - Düppenbecker, V. 1991, Gesteinseigenschaften und Verwitterungszustand der Monumente auf dem Nemrud Dağ, in *Begleitheft zur Sonderausstellung 'Nemrud Dağ - Methoden der Archäologie' des Westfälischen Museums für Archäologie und des Westfälischen Museumsamtes Münster*, Westfalen, 39-45 and 66-72; Fitzner/Heinrichs 2002=Fitzner, B. - Heinrichs, K. 2002, Damage diagnosis on stone monuments - weathering forms, damage categories and damage indices, in Prikryl, R. - Viles, H.A. (eds.) 2002, *Understanding and managing stone decay, Proceeding of the International Conference "Stone weathering and atmospheric pollution network"*, Swapnet, 11-56; Fitzner/Heinrichs/Kownatzki 1995= Fitzner, B. - Heinrichs, K. - Kownatzki, R. 1995, Weathering forms - classification and mapping, in: *Verwitterungsformen - Klassifizierung und Kartierung. Denkmalpflege und Naturwissenschaft, Natursteinkonservierung I*, Berlin, 41-88; Fitzner/Heinrichs/La Bouchardiere 2002= Fitzner, B. - Heinrichs, K. - La Bouchardiere, D. 2002, Damage index for stone monuments, in Galan, E. - Zezza, F. (eds.) *Protection and Conservation of the Cultural Heritage of the Mediterranean Cities, Proceedings of the 5<sup>th</sup> International Symposium on the Conservation of Monuments in the Mediterranean Basin, Sevilla / Spain, 5-8 April 2000*, Lisse, 315-326.
- <sup>32</sup> Preliminary results on stone types and their states of deterioration were presented in Fitzner/Düppenbecker 1991.
- <sup>33</sup> Cf. Fitzner/Heinrichs/Kownatzki 1995 and Fitzner/Heinrichs 2002.

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# Zebrapatterns in Campanian wall painting: a matter of function

Lara Laken

## Abstract

*Zebrapatterns are paintings with black and white stripes, usually covering the lower zone of a wall and often divided in panels reminiscent of marble imitation. They were in use in the Vesuvius area during the second half of the first century AD. Because they mainly appear in passage rooms, they have previously rarely been described and are generally thought to be secondary decoration, restricted to service areas. Thorough study of the pattern within its spatial context however leads to a different point of view: zebrapatterns were used in the first place to define public or common space.*

## INTRODUCTION\*

One of the first wall paintings that catches the eye upon entering the excavations of Pompeii through the modern entrance at the Porta Marina, is a pattern of black and white stripes. It is situated along a stairway directly to the right of the main road that leads through the city gate (fig. 1). These stairs belong to the so-called Villa Imperiale, a building discovered after a bombardment in 1943 that demolished the Antiquarium above.<sup>1</sup> Similar paintings are to be found across the street in an apartment complex linked to the Suburban Baths. These paintings cannot be easily seen since they are situated behind a closed gate and are much more worn. In Pompeii alone there are presently at least 28 examples in 10 buildings, and there are probably many more that have been washed away by rain, wind and sun. It is surprising that these kinds of paintings have been neglected by scholars for many years, and were rarely even described.<sup>2</sup>

These 'zebrapatterns' consist of a repeated system of black and white stripes oriented in varying directions. Until recently they have always and exclusively been considered as secondary decoration, because they mainly appear in rooms with minor functions such as corridors, ramps, staircases and passages.<sup>3</sup> Zebrapatterns are strongly linked to all-over patterns like checkerboard-patterns and geometrical and/or floral patterns.<sup>4</sup> These repetitive patterns all appear in the same period: from about 50 to 79 AD. At this time, the Fourth Pompeian Style was flourishing, a typically eclectic style of painting, in which many new combinations were introduced. Unlike other all-over patterns, zebrapatterns seem to be a truly regional phenomenon. Up till now, they have

only been found in the Vesuvian region.<sup>5</sup> They are thus not only confined topographically, but also chronologically, because they were all painted before 79 AD. Within this region, they are found in different spaces from the other all-over patterns. Therefore it seems worthwhile to discuss them in a separate article.<sup>6</sup>

## TPOLOGY

The pattern usually appears as a high dado, sometimes placed above a separate plinth, and varies in height from ca. 1.30 to 2 m. It generally covers the lower part of a wall divided into two painted horizontal zones, and is then combined with a plain white or simply decorated upper zone.<sup>7</sup> The pattern is usually divided vertically into panels marked by yellow or red borders.

*Fig. 1. Pompeii, Villa Imperiale, stairway with zebra-decoration. The same decoration was painted along the stairs to the upper floor, as can be seen through the window (photo: author).*



Fig. 2. Oplontis, so-called Villa of Poppaea, peristyle [32], S-wall and SE-corner. The zebra pattern was applied to both main and upper zone, and to the columns (photo: author).

An exception is found in the peristyle [32] in the Villa of Oplontis (fig. 2). Here the pattern was applied to the entire wall and even to the ceiling<sup>8</sup> and columns, in panels of differing proportions of which the arrangement is reminiscent of the First and early Second Pompeian Styles: dado, orthostates and isodomic courses.<sup>9</sup> Corridors [76] and [46] in Oplontis are slightly incongruous as well, because these have upper zones decorated with a common, although simple, Fourth Style system (figs. 3-4).

The strokes in the zebra patterns are either wavy or straight.<sup>10</sup> Different variants occur next to each other, in large quantities, in the Villa of Oplontis. In the peristyle [32] of this villa, panels with waves even alternate with panels of straight stripes. Based on this, it is hard to determine any chronological development of the patterns; they do not appear to become more and more schematic over time.

Not all zebra patterns are divided into panels; sometimes the pattern continues without any interruption. Such is the case in the corridors of two large public buildings: the porticus of the Palaestra in Herculaneum and the gallery of the Amphitheatre in Pompeii. In the first, the strokes fan out like the leaves of big plants (fig. 5); on the south wall they even start bending (fig. 6). The same system is found in the continuous decoration along a staircase in the Casa del Bracciale d'Oro in Pompeii (VI 17,42, fig. 7) and in corridor [26] of the so-called Villa of Ariadne in Stabiae. In the Amphitheatre, on the other hand, the strokes all point towards the right (fig. 8). This kind of pattern was used in ramp [A<sup>1-2</sup>] to the lower level of the Casa dell'Albergo in Herculaneum (III 19),



Fig. 3. Oplontis, so-called Villa of Poppaea, corridor [76], detail of W-wall: transition from middle to upper zone, and panel division in both zones. The vertical stripes (as well as the diagonal stripes) are straight (photo: author).



Fig. 4. Oplontis, so-called Villa of Poppaea, corridor [46], dado, main and upper zone (N-wall). The yellow bands in the upper zone correspond with those between the zebra panels (photo: author).



and in the common corridor [22] of the apartment complex on the second floor of the Suburban Baths. For most of these continuous patterns the strokes are always straight, but at the upper stories of the Suburban Baths, the one continuous pattern in corridor [22] has waves, like all other zebrepatterns in this apartment complex. Also in the Casa dell'Albergo the pattern may have had a wavy system, at least it looks as if the white paint was wavy, but it is too worn to tell now.

#### ORIGIN

As all four Pompeian styles are mainly based upon imitations of either a certain material, or an architectural system, a famous mythological painting or sculptural group (mostly Greek masterpieces), logically one of the first questions that comes to mind when studying Roman wall painting, is what source inspired the painter. Concerning



*Fig. 5. Herculaneum, Palaestra, porticus N (western part), N-wall: continuous pattern of stripes in all directions (photo: Daniel Castor).*

*Fig. 7. Pompeii, Casa del Bracciale d'Oro (VI 17,42-44), stairway with continuous zebrepattern (S-wall, taken from W; photo: author).*



*Fig. 6. Herculaneum, Palaestra, porticus N (western part), S-wall: continuous pattern in which the stripes bend over (photo: Daniel Castor).*



*Fig. 8. Pompeii, Amphitheatre, eastern corridor of main gallery (photo: author).*

repeating patterns, from which architectural elements and mythological scenes are usually excluded, this question is specific to the imitated material.

For zebrapatterns the most often proposed solution is that they are an imitation of marble slabs, the kind of marble, when specified, being bardiglio.<sup>11</sup> Still it is not in all cases clear whether stone imitation has been the intention. Accordingly, they have not been included by H. Eristov in her catalogue of painted marble incrustations in Pompeii (1979).<sup>12</sup> It also seems illogical, that in the series *Pitture e pavimenti di Pompei* (PPP) and *Pompei, Pitture e mosaici* (PPM) the zebrapattern with diagonal, nearly horizontal strokes in the fauces of Pompeii VI 16, 26-27 is called an imitation of bardiglio, while the zebrapattern with vertical strokes which decorated the façade of the same house is not.<sup>13</sup>

There are various possible arguments for an imitation of stone. Some zebrapanel have a white inner line, which usually suggests projection and therefore points to a relation to stone. However, shading has not been used nor have efforts been made to make the 'veins' of the marble stand out in such a way as to portray real stone. Of course the painting of an inner line could have changed into a meaningless practice, but there are also a lot of panels without inner lines. Those may be interpreted even less easily as stone imitations.

The wavy strokes in some of the patterns appear more like stone veins than do the straight stripes, but even they are still highly schematic. In the Villa of Oplontis both variants occur, as is evident from figures 9 and 10. These show that the zebrapanel in the covered *ambulatio* with seats [46] are far more schematic than those in the passage rooms behind the porticus west of the *piscina*. While in both patterns the panels have an inner line, the one near the *piscina* is more reminiscent of stone imitation.

One would maybe expect that only the patterns with waves are a stone imitation and that the straight strokes have developed from the wavy ones. However, this seems not to be the case. In the peristyle [32] of the Villa of Oplontis wavy and straight strokes are combined on one wall. With each next panel of the main zone, not only the direction of the strokes changes, but also the form (fig. 11). This also occurs in corridor [46] where the vertical strokes are wavy and the diagonal stripes are not (see fig. 9). Thus, instead of any development, the combination could have been born out of a need for variation in these elongated spaces.

The division of the peristyle walls in large pan-

els (orthostates) and smaller, rectangular blocks (isodomic courses) is similar to the features of the First Pompeian Style, which was based on the rendering of constructions in stone; this strengthens the presumption that this painting too refers to stone imitation. However this does not explain why these striped surfaces are also applied to the ceiling (fig. 12). One would not expect a real ceiling to be faced with marble slabs. The risk of pieces falling down would be serious, and in fact I do not know any example of a ceiling with marble slabs, neither visible by marble remains nor by imprints indicating that they were there.

I will come back to the discussion about stone imitation. First I would like to explore alternative possibilities. Taking into consideration what was said above about the peristyle in Oplontis, we may also look at it as a depiction of wooden panels. If this was the underlying idea, the black and white stripes might give a little too much contrast just to suggest the graining of wood. In this case, an imitation of timber framing, as was once suggested to me by E.M. Moormann, is more probable: the yellow frames around the panels may be interpreted as wooden frames, the black and white stripes as reed or small branches and clay or stucco respectively.<sup>14</sup> However, for constructive timber framing, the range of shapes that is represented in the black and white blocks of the upper zone, would be inappropriate: some lines are curved, others are in V-shape, etc. (see fig. 2, 11). To suppose that this decoration was derived from decorative timber framing, as for example executed on a more recent, small octagonal building in the Villa Borghese in Rome (fig. 13), is a little extreme. As far as I know there are no examples of decorative timber framing from antiquity; only examples of constructive timber framing.<sup>15</sup> The possible reference to wood or timber framing remains, then, a hypothesis that is hard to prove; it cannot prevail above the argument for an imitation of stone.

In several cases the zebra-decoration does not have a panel division, as was mentioned above (Herculaneum, Palaestra; III 19; Pompeii, Amphitheatre; VI 17, 42; Suburban Baths, [22]; Stabiae, Ariadne). In those cases no relation to stone is to be perceived at all, and so in most of these patterns the strokes are not wavy but straight. In three of the six continuous decorations the strokes fan out as if they were the leaves of big plants. It makes one think of a blown-up version of a dado painted with plants. On the other hand we may expect the painter to have chosen other colours - for instance green - if he truly wanted to create the illusion of plants.





Fig. 9. Oplontis, so-called Villa of Poppaea, corridor [46], panel with vertical stripes flanked by panels with diagonal stripes. Only the vertical stripes were wavy (photo: author).



Fig. 12. Oplontis, so-called Villa of Poppaea, reconstructed zebra decoration on beam at the junction of peristyle [32] and corridor [45] and on the ceiling of corridor [45] (photo: author).



Fig. 10. Oplontis, so-called Villa of Poppaea, passage room south-east of room [86], west of the piscina, W-wall (photo: author).



Fig. 11. Oplontis, so-called Villa of Poppaea, peristyle [32], S-wall, main zone: alternation of panels with wavy and straight stripes respectively (photo: author).



Fig. 13. Rome, Villa Borghese, octagonal pavilion with artificial timber framing (photo: author).



Remarkably enough, A. Maiuri has described the pattern in the Palaestra of Herculaneum as an imitation of bardiglio.<sup>16</sup> This is peculiar, because a division in panels is lacking here. Maybe he chose this term because the overall effect is greyish, as in most examples of real bardiglio, and did not take into account that the pattern is continuous. It might be that other scholars took over his terminology to describe zebrapatterns,<sup>17</sup> without being critical about whether they really imitate bardiglio.<sup>18</sup>

Looking closely at the different appearances of the stone bardiglio, we have to conclude that this stone does not look like what is painted in the zebrapatterns at all. Most kinds of bardiglio do not display any obvious contrast, as do the black and white stripes of zebrapatterns, but are just grey in various shades.<sup>19</sup> I have found very few examples that made me think of zebrapatterns. Only bardiglio cappella and bardiglio carrara scuro, the first with vertical, straight 'stripes' and the second with diagonal waves, are slightly reminiscent, at least on the photographs in several technical guides published by the Italian marble industry.<sup>20</sup> However, the scale of the photos is not always indicated and it remains obscure whether the veins are more or less the same size as the strokes in the painted patterns. Also, bardiglio cappella comes from either Lucca or Cappella (near Seravezza), and was probably not quarried during antiquity. According to H.W. Pullen, the original bardiglio 'antico' was taken from Carrara and Massa.<sup>21</sup> His list of ancient marbles still existing in Rome enabled me to check out the appearance of real bardiglio, in the right scale and definitely extant in antiquity. I have found that the antique columns and surface marbles that have been re-used in for example the churches Gesù e Maria and S. Maria Maggiore do not show the slightest resemblance to zebrapatterns; neither do the 16 columns from Hadrian's Villa which now carry the dome of the Sala delle Muse in the Vatican Museums.<sup>22</sup> Even the original pieces of bardiglio found in Pompeii,<sup>23</sup> do not look like the zebrapatterns that were painted there (fig. 14).

There are, moreover, no other imitations of bardiglio known in Roman wall painting, neither in Pompeii and the other Campanian sites, nor elsewhere in the Roman world, with which a comparison could be made.

Ancient writers do not bring us any closer. Nothing is to be found about bardiglio or its ancient variant in Pliny's book 36 dealing with marble and other stonetypes. Vitruvius, in his book 7 about interior decoration, does not even



Fig. 14. Pompeii, Casa di Apollo (VI 7,23), garden [23], column base faced with bardiglio strips (photo: author).

mention marble facing, let alone bardiglio.<sup>24</sup>

Summarizing, it may be stated that the origin of zebrapatterns is not as easy to detect as it seems. Comparing the possibilities, stone panels may be the first association that the painter wanted to evoke, although the kind of stone, if imitated, remains uncertain. In any case, the pattern probably soon started to live its own life, and we must keep in mind that inspiration does not necessarily mean imitation.<sup>25</sup> It is also possible, that the material to which the zebra stripes refer, is of less importance than the place where they were applied. I will therefore turn to the spatial context.

#### FUNCTIONAL ANALYSIS

##### 1. Relation to space

Space can be subdivided into static rooms, rooms in which people usually stay for a while, and dynamic rooms, which are mainly used to get from A to B. It has been noticed by D. Corlàita Scagliarini that static rooms normally have hypotactic wall decoration, in which one panel or one scene is the most important and the other parts of the wall painting are subordinate.<sup>26</sup> In dynamic rooms we mostly find paratactic decoration, in which all (vertical) parts of the wall are equal.

Zebrapatterns occur on façades,<sup>27</sup> in working spaces,<sup>28</sup> and in passage rooms: in dynamic rooms like corridors, staircases, peristyles (the only exception, the vestibulum in the House of Polybius, is discussed below). They make a typically paratactic system and therefore correspond perfectly with the decoration one would expect in these types of rooms. The changing directions of the strokes are undoubtedly used to create some vari-

ation in long corridors.<sup>29</sup> At the same time they may emphasise the speed with which the space is walked through - like an image flashing by. For the same reason, the large swastika-meander next to the stairs in Herculaneum V 18 is probably nothing but a daring variation on the zebra-motif. Not only its function as stairway decoration makes this likely, but also the way in which the motif is executed, with the same bold, wavy strokes in black on a white ground (fig. 15).

Spaces decorated with zebra patterns that are not just passage rooms, are usually interpreted as service or working spaces. For example, the painting in room [7] of house I 12, 11, made C.S. Nappo interpret this room as a storage space. The adjacent room at the street front (entrance nr. 10) would have served as a sales room. Nappo connects the functions of the two spaces with the owners' profession, which he does not mention as such, but can maybe be guessed at by the name given to the house, the *Casa dei Pittori*.<sup>30</sup> Likewise, the small hall [90b]<sup>31</sup> which forms the transition between the cryptoporticus and the atrium and vestibule of house nr. 10 of the *Praedia Iuliae Felicis*, could be interpreted as either a passageway or a working space and is generally thought to be part of the service quarters. A trial trench in the floor of this room, dug by Ch. Parslow in 1996, has not succeeded in making clear the function of this space.<sup>32</sup> Also the rooms around the peristyle in the Villa of Oplontis are generally interpreted as service rooms.<sup>33</sup>

For the application of zebra panels in latrines (Pompeii II 4, 10 and VII 1, 8) G.C.M. Jansen has given a convincing explanation: against the dark, uneven background dirt and damp would not become visible quickly.<sup>34</sup> In both the Stabian Baths and the *Praedia* of Iulia Felix these latrines are located amidst rooms that have the same zebra-decoration. From this Jansen concludes that the latrines were regarded as part of a group of 'practical' rooms, by others usually indicated as service quarters.<sup>35</sup> I think it also works the other way around. The function of the decoration in the latrines probably did not differ very much from the surrounding rooms. Jansen's explication may well apply to zebra stripes in corridors and staircases: scratches and smudges as a result of grazing against the walls would be barely noticeable, because white scratches and dark smudges fade away against the white and black of the strokes. The brushing of bodies and other items against the wall must have been a problem mainly in narrow corridors/stairways, in particular those with a lot of pedestrian traffic.

## 2. Public buildings

Passage rooms in public buildings are pre-eminently the spaces that were walked through every day by a large public. Therefore it is not surprising that in these rooms zebra patterns are regularly found. Although it is mostly assumed that zebra-decoration is specific for service corridors (as in Pompeii II 4, 10), examples in public buildings, on the contrary, show that it is more a matter of 'public function' (Herculaneum, Palaestra; Pompeii, Amphitheatre; Stabian Baths; Sarno Baths).

In the Sarno Baths there are remains of a zebra-pattern in ramp [1] (fig. 16) and the adjoining cor-

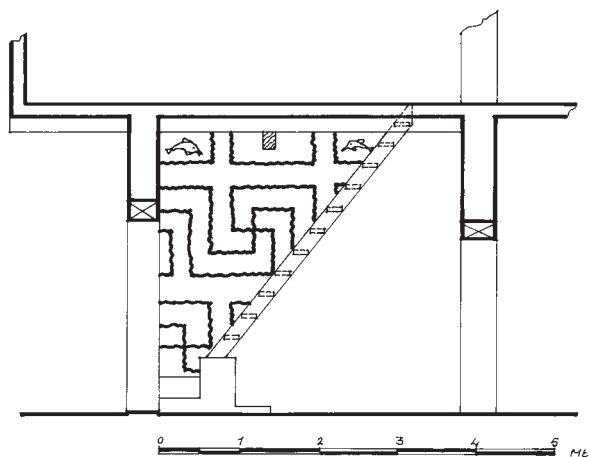


Fig. 15. Herculaneum, V 17-18, section: geometrical pattern flanking stairs [18] (drawing: Theo Laken, after Maiuri 1958, tav. 22).



Fig. 16. Pompeii, Sarno Baths, ramp [1], E-wall, southern end (level 3). To the right runs corridor [35], with a decoration of black panels at this side (photo: author).

ridor [35]. A. Koloski-Ostrow has observed that ramp [1] was probably made accessible from the street shortly before the latest building phase. The zebra-decoration was applied in this corridor during the latest phase, following earthquake damage (of 62 AD or later). According to Koloski-Ostrow the redecoration with a zebra pattern implies, that from then on this corridor was meant to be a public entrance and no longer just a service corridor for the bath.<sup>36</sup> Likewise, the gallery of the Amphitheatre, the porticus of the Palaestra (Herculaneum), and the latrine and corridors in the Stabian Baths were meant for visitors.

The second zebra striped corridor [35] in the Sarno Bath complex once led to the part where apartments were located. The appearance of a zebra pattern in the common corridor of an apartment complex is not unique; indeed the pattern seems to be used in every common space of the apartment complex located above another bath building, the Suburban Baths.

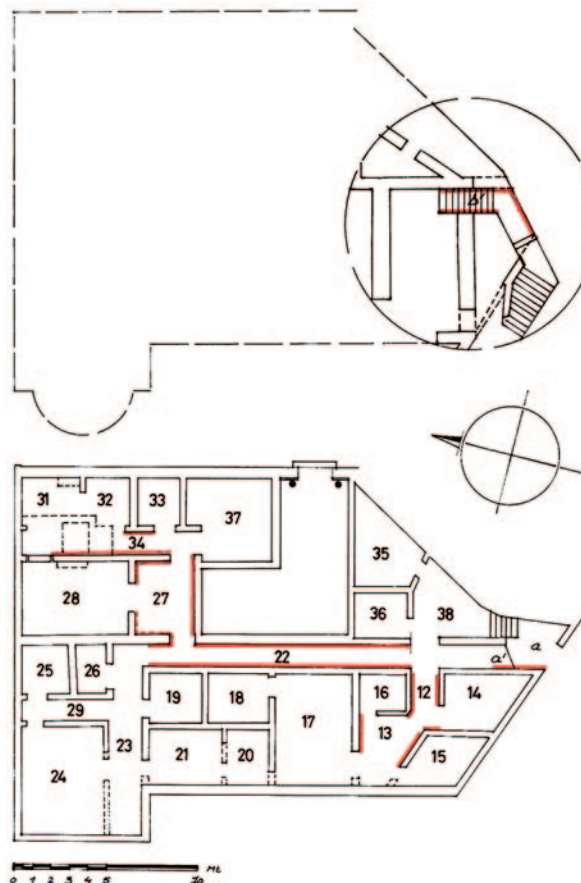
### 3. Apartment complexes

Apartment complexes must have been quite a new phenomenon in Pompeii's last years. The Sarno Baths and Suburban Baths were probably the first complexes with the characteristics of the *insulae*, the apartment blocks we know so well from Ostia Antica.<sup>37</sup> While the Suburban Baths were newly built according to a plan containing baths on the lower floor and apartments on the upper floors, including a separate entrance from the street, the Sarno Baths and the adjacent apartments were constructed within the lower stories of two or three former *domus*.<sup>38</sup>

The upper floor of the Suburban Baths now preserved, contains three apartments (*fig. 17*).<sup>39</sup> There must have been at least one other floor above, but it remains unknown how many apartments were planned on that floor. The three apartments can be reached through entrance [a] from the street, as well as through stairway [b'] from the baths. The first entrance gave access by some stairs down to space [38] and from there to the common corridor [22], which is also reached directly from stairway [b']. From corridor [22] one can enter apartment A through entrance [12] opposite the door of space [38]; apartment B at the left end of the corridor; and apartment C through passage [27] at the right of corridor [22]. All these spaces except [38] and the internal corridors of apartment B, are decorated with zebra patterns. Also passage room [13] in apartment A and corridor [34] in apartment C, both entered

from a room with zebra stripes ([12] resp. [27]), have a zebra-decoration. So all common spaces as well as the internal corridors and hallways of apartment A and C, have a zebra pattern. It could be that the owner of the complex decorated not only the common spaces that gave access to the apartments and to the common kitchen [37], but also left the rooms of the apartments already decorated for the tenants, with some merely standard paintings and floors. He logically chose a zebra pattern for the stairways and passage rooms.<sup>40</sup>

The same theory may be valid for the Sarno Bath complex. The reason that corridor [35] that led to the apartments of this complex has been decorated with a zebra pattern, was perhaps also because it was a common corridor. Another good argument that has been put forward by C. Goulet, and that is especially valid for the Sarno Bath



*Fig. 17. Pompeii, Suburban Baths, plan of upper floor and stairway [b'] showing situation of zebra patterns (drawing: Theo Laken, after Soricelli 1995, fig. 67-70, and Jacobelli 1988, fig. 51).*



complex, is that zebra patterns would have helped people to find their way in dark spaces:<sup>41</sup> they only had to follow the black and white stripes, and would know that they were still on public or common terrain.

#### 4. Private houses

The private houses in which zebra patterns have been found, are with a few exceptions, all large to very large domus and villae. This is not surprising, because small houses seldom have a separate service quarter, and long corridors would be absolutely unnecessary.<sup>42</sup>

I have mentioned above that zebra patterns usually appear in dynamic rooms. The only zebra pattern which was not applied in an indisputably dynamic space, is situated in the vestibule [A] of the house of Iulius Polybius (IX 13, 1-3, see fig. 18). This wide, high walled room lies where one would generally expect an atrium, directly behind the fauces [3]. Instead, the atrium [O] lies further behind and can be reached from the entrance room through passage [E], which, with a few steps and a rising floor, bridges the difference in height between the atrium and entrance room. E.W. Leach has put forward convincing arguments for the interpretation of room [A] as a *vestibulum*, the entrance room in which *clientes* would gather together each morning, in expectation of the *salutatio*, the daily talk with their *patronus*.<sup>43</sup> This is one of the few vestibula known in Pompeii; in most cases the *clientes* stayed in the fauces, or an uncovered part in front of the fauces. Some houses have benches built at the entrance, witnesses to the existence of waiting clients.<sup>44</sup>

In the upper zone of the vestibulum, a First Style decoration has been preserved. Original First Style paintings in old, republican houses were considered very representative. According to Leach's opinion, Iulius Polybius, descendant of an imperial freedman, who had obtained the house after the earthquake in the sixties, took great advantage of this representative character by receiving his big clientela in the vestibulum, during the years he was elected aedilis.<sup>45</sup> Indeed the slogan painted in the fauces, *C. Iulium aed(ilem)*, seems to indicate that the vestibulum was visited by many clients (fig. 19). Another slogan was found elsewhere in the house: *C. Iulium Polybium d(uo) vir (...)*.<sup>46</sup> On the basis of graffitti slogans J.L. Franklin has reconstructed that Polybius stood up for duovir in 73 AD, next to M. Lucretius Fronto, who belonged to one of the most important families in Pompeii. Unlike Fronto, Polybius still had

to achieve a greater reputation, judging by the many slogans for his election (at least 33) found throughout the city. On the other hand, he must have been successful and prominent enough to be eligible together with Fronto.<sup>47</sup>

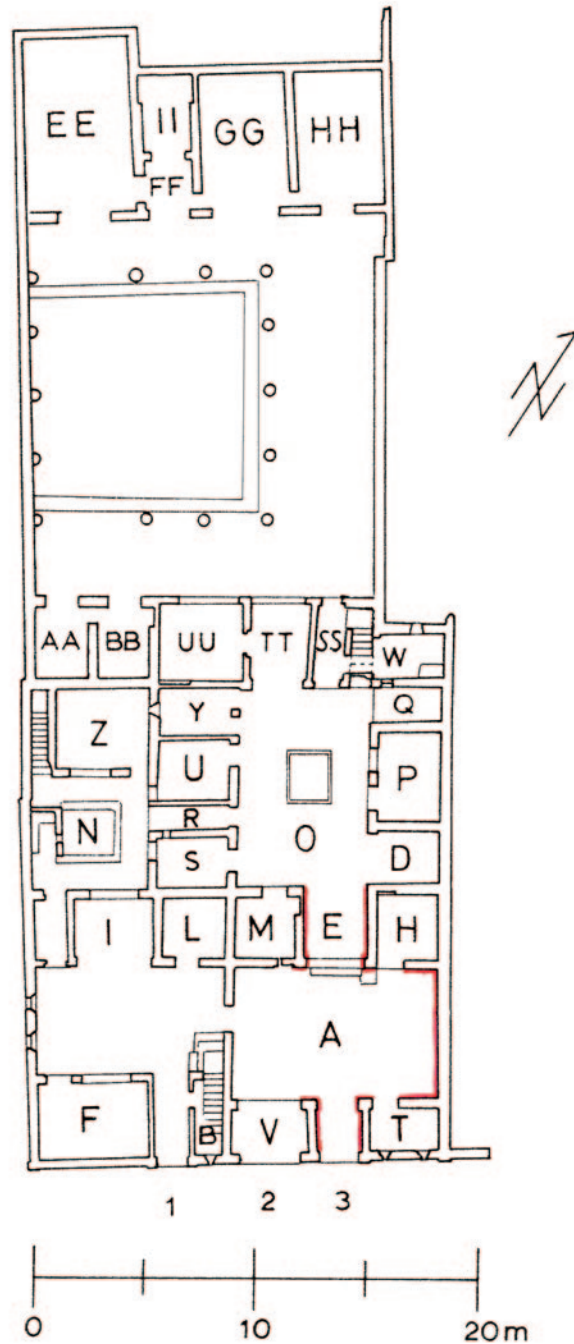


Fig. 18. Pompeii, House of C. Iulius Polybius (IX 13, 1-3), plan showing situation of zebra patterns (after Kockel 1986, Abb. 47).

It is therefore surprising, that Polybius in fauces, vestibulum and passage [E] under the representative remains from the First Style, purposefully chose a zebra-pattern, a kind of decoration that is generally considered secondary, and thus far from representative.<sup>48</sup> For this apparent contradiction there are several possible solutions.

Some scholars, for example P.G.P. Meyboom and Leach, take the situation in the house of Iulius Polybius as an indication that zebra-patterns were mainly applied as a temporary decoration, a quickly painted marble imitation in expectation of a later opportunity to apply the definitive decoration.<sup>49</sup> A. De Franciscis and F. Zevi only mention that the lower part of the vestibulum walls was under reconstruction.<sup>50</sup> People were indeed still working on the decoration of this room at the time of the eruption; the west wall had not yet been finished. Amphorae containing materials for plastering are still standing in a corner of the



Fig. 19. Pompeii, House of C. Iulius Polybius (IX 13, 1-3), fauces with zebra-decoration and slogan C. Iulium aed(ilem) (photo: author).

room. The possibility of a temporary decoration, however, is less probable since the pattern seems to be chosen deliberately with reference to the zebra-pattern in passage [E]. This was supposedly older; the pattern has been painted over two or three times, and might possibly have been in the process of being repainted on this occasion.

The idea that zebra-patterns in general would have been used as quick, temporary decoration, is not only contradicted by the relatively high quality of some paintings in the villa in Oplontis,<sup>51</sup> but definitely by the large quantity of patterns found there. It would be very unusual to have half the villa decorated with temporary systems.

A second explanation could be that the vestibulum was no longer in use as such, but turned into a working space. This explication is unsatisfactory, because the slogan in the fauces has been painted on the coarse layer of plaster directly above the zebra-pattern, and was not covered by it (fig. 19). This implies that either the zebra-pattern and the slogan are contemporary, that is, from the period when the vestibulum was frequented by Polybius' clientela; or that the slogan was still considered worth leaving visible when the zebra-pattern was applied, and thus the function of the space was still appropriate for propaganda.

Another option is to reject the idea that zebra-patterns only occur in secondary rooms. Maybe the zebra-pattern in this vestibulum has the same 'public' connotation as the patterns in public buildings mentioned above, the public, or rather visitors, being the clientes. Possibly this also goes for corridor [46] in Oplontis, where the benches along the wall may indicate that this corridor functioned as a waiting room as well.

If this supposition is correct, it might be assumed that, in private dwellings, corridors and passages that are not part of service quarters were regularly used by individuals other than the inhabitants, for example by guests. This could have been the case in some spaces in the villa of Oplontis, like corridor [76], and the unnumbered passage rooms west of the piscina;<sup>52</sup> and, for example, in VI 17, 42 on stairway [14], since this led to triclinium [31], which was primarily used for hosting guests.

#### CONCLUSION

From the evidence of the zebra-patterns in Pompeii, Herculaneum, Oplontis and Stabiae, we may conclude that zebra-patterns were applied more because of the function that they had within a space, than their reference to a particular material. Their purpose was practical; they were rela-

tively easy to apply and damage or dirt would easily be camouflaged. Not only did they enliven dark and sometimes elongated spaces, they also were a help to people to find their way in dark spaces, especially in complexes where a lot of corridors and stairs would come together.<sup>53</sup> Moreover, they were highly recognisable, in whatever design they were painted. Contrary to what has been often assumed, they are not mainly found in service quarters, but in common or public spaces, and because they could easily be recognised, zebra-patterns may well have functioned as indicators of public space.

#### CATALOGUE

##### Herculaneum/Oplontis/Pompeii/Stabiae

- a: site; building or house (Region nr., Insula nr., house nr.)
- b: room [nr.]
- c: description of the painting
- d: remarks on painting technique
- e: date of painting (as given in literature)/remarks on relative date
- f: literature

House numbers and room numbers are according *PPP* and *PPM* (for Pompeii), or the literature mentioned under f. For a ground plan of each house in Pompeii, see *PPM*.

- a: Herculaneum *Insula Orientalis* II. Palaestra
- b: northern porticus, west side (fig. 5-6)
- c: Continuous pattern (not split up in panels) of black and white stripes in all directions, entangled with one another towards the upper border, as if they were fern's leaves. Above the black upper border are a white main/upper zone and vault.
- f: Maiuri 1958, 134; G. Cerulli Irelli, *Ercolano*, Napoli 1969, tav. 3.
- a: Herculaneum III 19. Casa dell'Albergo
- b: corridor [A<sup>1-2</sup>]
- c: The zebra-decoration is plastered roughly over the white stucco of the vault (H. 2.45<sup>54</sup>), which therefore may be older than the zebra-pattern, at the height of 1.92 m, without any upper border. The pattern is continuous, but preserved in pieces of max. 2.30 m in width, on both N/W-wall and E-wall. It has no borders.
- d: Black stripes are straight, painted over by white wavy strokes.
- f: Maiuri 1958, 332 (without description of the pattern), fig. 263 (groundplan), 264.
- a: Oplontis, so-called Villa of Poppaea
- Many rooms of this villa, mainly corridors, were decorated with zebra-patterns. The patterns mostly occur on a high dado or on a main zone above a separate plinth, in panels bordered by yellow or red bands. They are found in the following spaces (see groundplan in fig. 20): corridors [6] and [unnumbered] flanking peristyle [20]; hall between atrium [5] and peristyle [20] (on a low dado or plinth: fig. 21); exedra/niche [1]; peristyle [32] and stairway [42] to the upper floor; corridor [45]; corridor/ambulation [46]; (L-shaped) corridor [52]; cor-

ridor [53]; corridor [62]; corridor/back room [63]; corridors [67] and [71] to room [69]; the (unnumbered) spaces south- and north-east of room [86]; corridors [76] and [77]; *torcularium* [83]. Some of these rooms are discussed separately.

- b: peristyle [32] (fig. 2, 11)
- c: The zebra-pattern covers the main zone, upper zone, ceiling and columns. Observations S-wall, east side: Above a solid red plinth, painted black and white striped panels cover the middle zone like *orthostates*. The stripes of these panels slant alternately to the right or left; in the latter they are rendered wavy. The upper zone is comprised of four painted rows of smaller slabs in stretcher bonding (*isodomic courses*), in which the stripes are one time diagonal, another time vertical, another time in V-shape or concave horizontal. Here the white is emphasized, while in the middle zone the black stripes are dominant. The slabs of the second and fourth 'isodomic courses' lie exactly above the panels of the main zone, which means that the vertical yellow borders are all in one line. The vertical borders of the first and third courses however are to be extended to a yellow band visible on the plinth. The division of the wall in slabs falls back on the decoration systems of the First Pompeian Style.<sup>55</sup>
- The same pattern was used for the ceiling (H. 3.20 m), which has been partly reconstructed on the west side, and for the underside of the architrave, between the columns (here ca. 0.30 m wide, again between two yellow bands). The columns of the peristyle as well carry a zebra-decoration (fig. 2), applied in four aliquots, mostly in alternate diagonal directions, before four vertical red lines (ca. 3 cm wide) were painted. The railing between the columns was, on the porticus side, also decorated with a zebra-pattern. The width of the panels and the direction of the stripes in this case seem to be adapted to the available space, which is not between all columns the same (cf. groundplan, fig. 20). I have not discovered any relation (in size or stripes direction) to the pattern used on the walls opposite.
- e: Late Fourth Style (Thomas 1995, 154-159).
- f: De Franciscis 1975, Taf. 38-39; *Pompejanische Wandmalerei*, Taf. 159-160; *La peinture de Pompéi* II, 245 (fig. 469a-b); Thomas 1995, 157-159, Abb. 105.<sup>56</sup>
- b: corridor [45]
- c: The zebra-pattern covers the main zone, upper zone and ceiling. The division on the walls is the same as in peristyle [32], only here a fifth isodomic course is present. Contrary to the upper zone in the peristyle, the 'isodomic blocks' of the upper zone here do not look brighter than the other panels. At the western end of this corridor, part of the ceiling was reconstructed (fig. 12). It consists of black and white striped panels of ca. 0.80 x 0.65 m, divided by yellow borders. The stripes slant in opposite direction to those of the next panel. At the junction of peristyle [32] and corridor [45] a beam covered with plaster was also reconstructed (fig. 12). Two rows of small panels in stretcher bonding (together ca. 0.50 m in width), bordered by yellow bands, cover the entire beam length (2.34 m). The stripes are diagonal in opposite directions, the white stripes two times the size of the black ones.
- e: Probably from the same period as the paintings in peristyle [32].
- f: Unpublished.



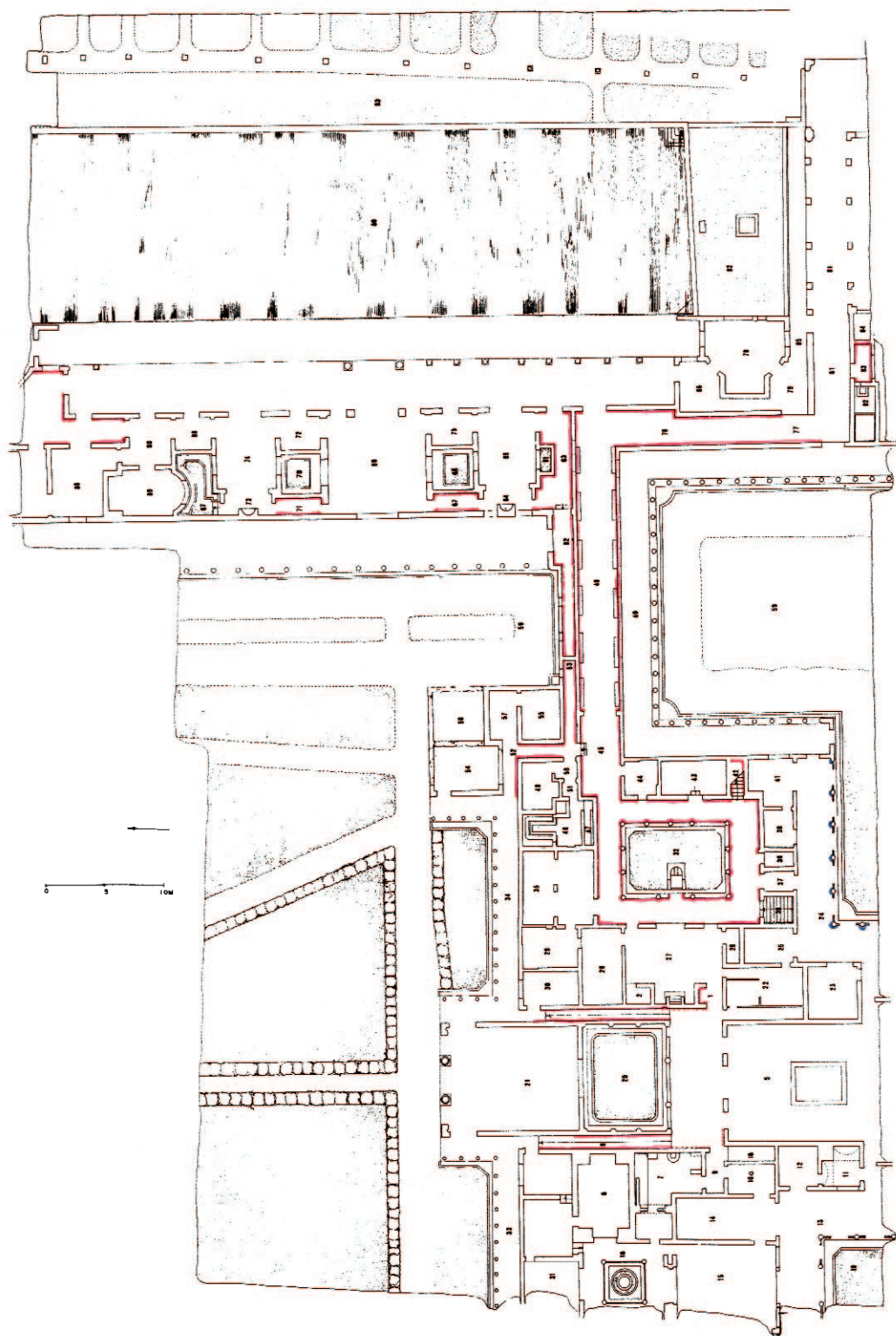


Fig. 20. Oplontis, so-called Villa of Poppaea, plan showing situation of zebra patterns (after Pompei: Abitare sotto il Vesuvio, fig. 32).

- b: corridor/ambulatio [46] (fig. 4, 9)
- c: High panels above a red plinth with coloured stains and small benches respectively (in the same design and as high as the plinth). There are 16 panels on the N-wall; on the S-wall six are preserved on the east side and four on the west side. Except for one narrow side-panel (0.88 m), the width of the panels varies between 1.38 and 2.30 m. Yellow borders with a white line mark the division between the panels and between main zone and upper zone. The direction of the stripes seems to show a strict alternation from eastward to vertical, to westward, and again to vertical, even reflecting in N- and S-wall - if a deviation on the N-wall (in the sixth and seventh panel from the eastside) would not have changed the scheme. The diagonal stripes are straight, while it looks as if the vertical stripes are meant to be wavy (see fig. 9). The panels were given a white inner line, painted over the black and white stripes, possibly to suggest relief. It runs parallel to the white line and yellow bands framing the panels, and 'disappears' in the plinth; the distance from the yellow frame ranges from 19 to 35 cm: it increases with the increasing width of the panels.

The upper zone shows a paratactic system of white panels with pink and green embroidery borders. It has a yellow frame here and there, corresponding with the vertical yellow bands that frame the zebrawalls (fig. 4). It is possible that the - at first sight irregular - outlines of the zebrawalls have been adapted to the layout of the upper zone, as was done in corridor [76]. The ceiling decoration, also with embroidery borders (among other things) on a white ground, was very finely executed. The corridor is illuminated by broad windows (ca. 2.50 x 1 m), high up in the S-wall.

- d: The *giornata* is visible above the yellow upper border, on the transition to the upper zone.
- e: Fourth Style (as is clear from the upper zone and ceiling).<sup>57</sup>
- f: *Pompeii: Abitare sotto il Vesuvio*, 137, tav. 61.

- b: corridor [76] (fig. 3)
- c: High panels above a red plinth. The pattern shows a regular scheme of changing stripe directions: vertical, upward to the right, to the left, vertical, upward to the left, to the right, etc. (13 panels on the W-wall); only on the E-wall appear irregularities at the corner where the corridor narrows, and on the last panel next to the door opening to room [78]. Accordingly, the panels of the two walls do not reflect one another. The panels have a white inner line, as in corridor/ambulatio [46]. Contrary to [46], however, the vertical zebra stripes are *not* rendered wavy (fig. 3); they are straight in all directions. The width of the panels is adapted to the white grounded upper zone, on which broad panels alternate with narrow panels and red bands respectively. The system can be divided in rows of four broad panels, in the middle of which is a narrow panel flanked by red bands, and on both sides between the next two (broad) panels are even narrower panels flanked by green bands. On the outer sides of a row are red bands, separating it from the next rows. The W-wall can be subdivided into three parts with the scheme described above. The division of the zebrawalls is centred underneath the narrow panels (a little bit to the right of their central axes) and the red separation borders (cf. fig. 3).

- d: Along the upper border of the zebrawalls one can see that the stucco was applied over a red band: this is the lower border of the upper zone, of which part was left visible above the yellow band (fig. 3). The contours of the panels were drawn in black lines, before the black and white stripes were painted; nevertheless they were carelessly painted across (fig. 3).

- e: Fourth Style (as is clear from the upper zone).
- f: A. Barbet, *La peinture murale romaine. Les styles décoratifs pompéiens*, Paris 1985, fig. 32.

- b: passages [unnumbered] south-east and north-east of room [86] (west of the piscina; see groundplan on fig. 20; fig. 10, 22).

- c: High panels without separate plinth. The zebra decoration has a strong resemblance to stone: the stripes are all wavy. The panels were framed by red borders with a thin white line; a similar white line was added as inner line. The whole was carefully elaborated. The upper zone was white (and now shows traces of volcanic strata).

- f: *Pompeii: Abitare sotto il Vesuvio*, 158, tav. 62.



Fig. 21. Oplontis, so-called Villa of Poppaea, hall between atrium [5] and peristyle [20], W-wall: zebra-pattern on plinth, combined with main and upper zone in Fourth Style (photo: author).



Fig. 22. Oplontis, so-called Villa of Poppaea, passage room north-east of room [86] (and west of piscina), W-wall: zebra stripes in diamond shape (photo: author).





Fig. 23. Oplontis, so-called Villa of Poppaea, torcularium [83], E-wall: pattern of double convex and double concave rows (photo: author).



Fig. 24. Pompeii, Casa dei Pittori (I 12, 11), room [7], remains of zebra decoration on N-wall (photo: author).



Fig. 25. Pompeii, Casa dei Pittori (I 12, 11), fauces [1], W-wall: zebra stripes heading towards entrance (taken from S; photo: author).



Fig. 26. Pompeii, Praedia Iuliae Felicis (II 4, 10), passage [90b], W-wall: two even panels with vertical stripes (photo: author).



- b: *torcularium* [83] (fig. 23)
- c: High panels above red plinth. The pattern is best preserved on the E-wall. It shows striking rows of convex lines, curved horizontally in two rows on one panel; the next panel has two concave rows (see fig. 23). The S-wall probably had a similar system, but with less curved lines (more V-shape and triangle). The shape of the stripes can be compared to those on some of the *isodomic* blocks in peristyle [32], but since the shape of the panels is different (vertical), the curves are endlessly repeated in order to fill the shape of the panel.
- f: On space [82]–[84] (*torcularium*): Pompei: *Abitare sotto il Vesuvio*, 138.
- a: Pompeii I 11, 10-11. Caupona of Euxinus
- b: garden [4], room [5]
- c: W-wall: zebrapattern of vertical wavy strokes. No longer *in situ* (?).<sup>58</sup>
- f: Jashemski 1993, fig. 373 (= 1967, fig. 14), 374. (Not in PPP/PPM).
- a: Pompeii I 12, 11. Casa dei Pittori
- b: fauces [1], courtyard [2], corridor/storage [5], room [7] (fig. 24)
- c: High panels rising from the ground (without separate plinth), divided (and separated from the upper zone) by red borders with a thin white line. An extra inner line was applied to suggest the projecting panel of the block. The distance from this inner line to the ground is bigger (at least 10 cm) than the distance between inner line and upper border. At the bottom of the wall, a broad black stripe borders the bottom of the panels. The direction of the strokes, as far as can be distinguished, was either to the left or right, or vertical. Only in the fauces do the stripes of all panels head towards the same direction: towards the front door, in southern direction (fig. 25). It seems that both fauces walls were divided into two equal panels, with a red border in the middle of the wall. This means that the panels of the E-wall are reflecting those of the W-wall and vice versa.<sup>59</sup>
- e: The zebrapatterns in the different rooms were probably all applied at the same time. In the courtyard the pattern is interrupted on the W-wall by a blocked doorway to the room with entrance 13 to the street. The disposing of the south-western part of the house – possibly due to a change of the owner<sup>60</sup> – was thus probably later than the application of the pattern.
- f: PPP I, 178; PPM II, 807, fig. 19.
- a: Pompeii II 4, 10. *Praedia Iuliae Felicis*
- b: service room or *andron* (passage) [90b] (fig. 26)
- c: High zebrapanels covering the lower half of the wall. They all have vertical black and white strokes,<sup>61</sup> that were originally probably wavy, but this is now very hard to distinguish. The panels were framed by red bands, which have also been used in the corners and return in the red frame of the upper zone. Their width varies, depending on the surface of the walls, which is in most cases filled with one panel: S-wall 1.11 m; S-E doorpost 0.24 m (the maximum preserved decoration is approximately equal to the width of the doorpost); E-wall/N-side (next to door) 1.16 m; N-wall 0.92 m; on the W-wall the preserved width is 1.43 m, consisting of two even panels (fig. 26). Directly north of those two panels there is a blocked door (H. 1.70 x W. 1.03 m) to the latrine west of this room. This blocking does not show any remains of zebra-decoration: the latter is broken off exactly next to the blocked door, and is probably not just by coincidence divided into two panels. If the door would have been blocked before the zebra-pattern was applied, the pattern would have presumably been divided into three wider panels covering the entire length of the wall, more in harmony with the sizes of the other panels. It may thus be concluded that the zebrapattern was applied when the doorway to latrine [89b] was still in use.
- e: Fourth Style (PPP I, 239)
- f: Strocka 1975, 102, Abb. 75; PPP I, 239; PPM III, 278, fig. 162; on the architecture: Ch. Parslow, *RStPomp* 7 (1995-1996) 115-132; 162-172.
- b: latrine [89b]
- c: In this latrine (3.32 x 1.10 m) there are some remains of the same kind of decoration as in room [90b], reaching more or less to the same height (1.53 m above the 1996 floor level, observation S-wall). The pattern continues behind a low wall (H. ca. 0.30 m) which was built, maybe during the same reconstruction period when also the door to room [90b] was blocked, at right angles between the S-wall and a pillar between two (new?) entrances in the N-wall.
- e: Since the height of the panels is more or less the same as those in room [90b], and the paintings were applied when there was still a connection between the latrine and that room, the paintings probably date from the same period.
- f: Jansen 1993, 30, 32.
- b: hortus-façade
- c: Zebrapattern of panels with diagonal strokes slanting to the right. Because of wear it cannot be determined whether the strokes were rendered wavy. The upper zone shows a (two-dimensional) painted imitation of *opus quadratum*, white blocks in bonding with a red frame. On the S-wall (reverse of N-wall room [91], L. 5.72 m), the westernmost 1.19 m, which are under the colonnade flanking the viridarium, are stuccoed over and painted with a regular Fourth Style decoration. The external decoration was applied after the construction of the (now reconstructed) partition wall between hortus and viridarium, since at the doorpost east of room [91], the plaster was applied around the jamb.<sup>62</sup>
- e: Fourth Style (PPP I).
- f: PPP I, 232-233; PPM III, 199, 230, 236, fig. 19, 73, 81-82.
- a: Pompeii II 6. Amphitheatre
- b: main gallery on ground floor (fig. 8)
- c: The pattern is best preserved in the eastern corridor, especially directly east of the northern entrance. Remains of the pattern, which was combined with a white upper zone and vault, can be recognised on the side walls all along the corridor, as well as on the back wall, and it was also applied in the small stairways that lead from this gallery to the seating area. In some places the stripes seem vertical instead of diagonal. The gallery west of the northern entrance (side walls and back wall) has remains of the same kind of painting, which are unfortunately practically unreadable.
- d: Black stripes painted on a white ground.
- e: Probably Fourth Style.<sup>63</sup>
- f: Unpublished.
- a: Pompeii VI 16, 26-27
- b: fauces [A]
- c: Three panels, from the threshold to the end of the fauces (N-wall). On the S-wall the zebra-decoration

- stops at a blocked off door; west of this door the wall has a different kind of decoration.<sup>64</sup> The angle of the strokes is very flat, nearly horizontal.
- f: PPP II, 363; PPM V, 892-893 fig. 3-5.
- b: façade (on both sides of entrance 27)
- c: The decoration is unreadable. From the picture in PPM, the following may be surmised: high panels with vertical black and white strokes, combined with an upper zone of imitated opus quadratum: white blocks.<sup>65</sup> It is striking that to the left of entrance 27 the lowest row of blocks has been left out and was substituted with higher zebra panels. The reason for this might be the steepness of the street.
- f: PPP II, 362; PPM V, 891 fig. 1.
- a: Pompeii VI 17 (*Ins. Occ.*), 42-44. Casa del Bracciale d'Oro
- b: stairway to 2<sup>nd</sup> subfloor (fig. 7)
- c: High dado with continuous zebra motif under a white main/upper zone and vault. The upper border of the dado follows the downward tendency of the ramp and stairway. Down the panels along the stairs runs a black band (6 cm). The stripes above fan out as in the porticus of the Palaestra at Herculaneum, and sometimes they cross one another. The decoration ran for a distance of about 6 m.
- On the N-wall next to the stairs, the reverse of the summer triclinium [31], fragments of a second zebra pattern have been reattached. It borders on a small, low, in-between room (storage space?), and reaches to the same height as the latter (1.90 m). Above is a white upper zone. On this wall the orientation of the stripes is to the right.
- d: Along the stairway vertical black lines (0.4 cm) are visible under the zebra stripes, at a distance of 0.79-0.80 m. Since they were painted before the zebra stripes, this was probably by means of a preparatory design, although they don't seem to mark specific spots (for example where the stripes cross). They are perpendicular, while the zebra stripes are adapted more to the descending line of the upper border. The transition between upper zone and dado, the *giornata*, is clearly visible above (and partly underneath) this border.
- f: Unpublished (for position of dado, see section of the house in PPM VI, 45).
- a: Pompeii VII 1, 8. Stabian Baths
- b: corridor [H]
- c: The *giornata* runs above the red upper border; the upper zone is white. The N-wall consists of two parts: the western part is the reverse of rooms [U] and [T] and stands a bit (0.34 m) behind with regard to the eastern part, which is the reverse of room [S]. The panels on the west side have vertical strokes, including the post of the entrance from the street and the transition between western and eastern part of the wall; the panels on the east side had maybe diagonal strokes in opposite directions or strokes in V-shape;<sup>66</sup> the stripes on the right-most panel were probably painted in diamond shape.<sup>67</sup> This is all hard to see nowadays, because the paintings have almost completely faded. The panels on the S-wall have diagonal strokes in alternating directions; the left most panel might have had diamond shape stripes, as the panel opposite, on the N-wall.<sup>68</sup> The average width of the panels is 1.10-1.12 m; the panels on the east side of the S-wall (east of two corridors) are wider: 1.33-1.40 m. The maximum height of the panels, at approximately the middle of N-wall, is 1.77 m; from there the floor of the corridor rises towards the street, but the upper border of the panels does not.
- d: The wavy rendering of the strokes seems the same as in passage [N5] (see below), but it is hardly visible.
- e: Fourth Style (PPP III, 21); according to M. and A. de Vos, the painting is Neronian or older: a Neronian graffiti in the fresco layer of corridor [H] provides a *terminus ante quem*.<sup>69</sup>
- f: M. and A. de Vos in Eschebach 1979, 93, Taf. 24a, 55d; PPP III, 21; PPM VI, 178 fig. 49.
- b: corridor [J]
- c: In the eastern part of corridor [J] that forms the entrance from the palaestra via passage [N5] to latrine [O], a zebra pattern is visible in the S-W corner (fig. 27; data in table), as well as some faded remains (mainly the yellow upper border) on N-, E- and eastern part of S-wall. There is relatively more white than in rooms [N5] and [O].
- d: First black straight stripes; in between filled up with white wavy strokes; after this, the white still being wet, wavy black strokes over the black stripes, taking some of the white with it. The effect is that the two colours run (fig. 28).
- b: passage [N5]
- c: Both walls consist of one wide panel that fills the space in between two mullions from floor to vault, and is separated from the white vault lunette by a yellow border.
- d: In the middle of each panel a vertical line was incised; a horizontal line apparently was considered unnecessary: consequently the strokes do not join.
- b: latrine [O]
- c: The panels run either from the ground or from right under the supports of the toilet seats, to a height of 1.65 m (observ. W-wall). They are framed by yellow borders (the under border was left out at the seats). The latrine has a white barrel vault, starting directly above the zebra-panels.
- d: In preparation for the painting, a deep horizontal line was incised slightly under the middle of the panels (av. height 0.75 m). It seems that here and there underneath the yellow upper border, a yellow line has been used as a preparatory design; no incision is visible there.
- e: Fourth Style (PPP III, 21-22)
- f: M. and A. de Vos in Eschebach 1979, 93, Taf. 4b, 67b; PPP III, 21-22; Jansen 1993, 30, 32; Thomas 1995, 157-159, Abb. 106, Koloski-Ostrow 1996, 81, fig. 4-5; PPM VI, 179 fig. 52-54.
- a: Pompeii VII A, 2. Suburban Baths/upper floor (plan: fig. 17)
- b: entrance [a]
- c: Two high panels *in situ* on W-wall (measurements taken of left panel), of which the second continues above the space where once must have been stairs [a'] to another floor.<sup>70</sup> The panels probably did not have a separate plinth.
- d: It seems that first black straight stripes have been painted, which are each painted over with a black wave.
- e: Fourth Style (PPP III, 236).
- f: PPP III, 236.
- b: stairway [b']
- c: The maximum height of the panels is 2.20 m, opposite



Fig. 27. Pompeii, Stabian Baths (VII 1,8), eastern part of corridor [J], S-W corner opposite passage [N5] to the public latrine [O] (photo: author).

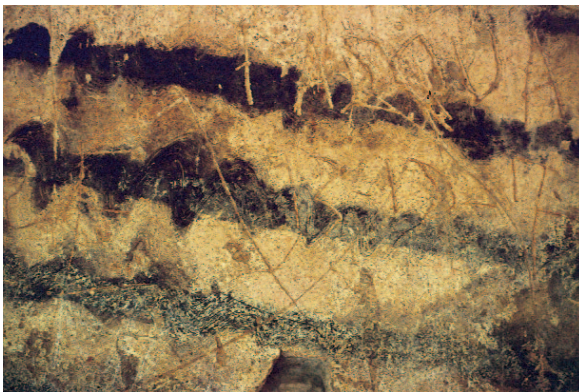


Fig. 28. Pompeii, Stabian Baths (VII 1,8), eastern part of corridor [J], detail of S-wall, in which the painting technique is clearly visible (photo: author).

the stairs to corridor [22]; the entire zebra-decoration reaches to the same horizontal level (that is from floor to ceiling) and does not follow the inclination of the stairs. On S- and W-wall the pattern still has a red upper border (like the vertical borders). Directly above, the E- and W-wall along the stairs are covered with white plaster.

f: Soricelli 1995, fig. 72.

- b: corridor [22]
- c: Continuous pattern with yellow borders at each end of the corridor, as well as along the upper side of the pattern. The stripes are wavy and run from the ground upwards in southern direction: on the E-wall upwards to the right and on the W-wall upwards to the left.
- d: On the E-wall (not far from the S-end) it is clearly visible that straight, black stripes have been drawn, over which in a wavy movement white strokes were painted.
- e: Second building phase of the apartment complex (Soricelli 1995, 114-115).
- f: Soricelli 1995, 115.

- b: passage [27]
- c: Big parts of zebra-pattern *in situ* on S-, W-, E-, and eastern part of N-wall, as well as the N-side of the entrance to corridor [22]. The panels probably had strokes in alternating directions, creating a fishbone-effect, as may be concluded from the remains of three panels in the NE-corner. The measurements given in the table were taken from the E-wall.
- d: First black straight stripes were painted, after that each was painted over with a black wave.
- e: Second building phase of the apartment complex (Soricelli 1995, 114-115).
- f: Soricelli 1995, 115, fig. 73.

- a: Pompeii VII A, 2. Suburban Baths/upper floor: apartment A
- b: entrance [12]
- c: High zebra-panels from floor to ceiling; there are some 10 cms of white plaster between the red upper border and the beam holes. The S-wall consists of one broad panel, from mullion to mullion, while the N-wall, which is longer and makes an angle towards the door to room [13], is divided into three panels: two on the straight part of the wall, with diagonal strokes in opposite directions, and one narrow panel from the angle to the doorway (between two red borders; total width 0.28 m), of which the strokes follow the direction of the last panel (upwards to the left). The W-wall consists of a panel in between the entrances to [13] and [14] (0.66 m in width, borders included).
- d: Execution rather careless.
- e: Second building phase of the apartment complex (Soricelli 1995, 114-115).
- f: Soricelli 1995, 114.

- b: passage [13]
- c: The panels are not preserved in full height on any of the walls. The N-wall has two panels; the S-wall three; the E-wall between rooms [13] and [16] has collapsed. The direction of the strokes is only clearly visible on the left-most panel of the S-wall, where they run upwards to the left.
- e: Second building phase of the apartment complex (Soricelli 1995, 114-115).
- f: Soricelli 1995, 114.

- a: Pompeii VII A, 2. Suburban Baths/upper floor: apartment C
- b: corridor [34]
- c: The E-wall has one zebra-panel between the entrances of rooms [32] and [33]. On the opposite wall three panels are to be seen, of which the division does not reflect the borders of the first. The decoration of this W-wall con-



- tinues behind the new construction in rooms [31] and [34]. The panels have wide, yellow borders, that are even wider at the slightly curving sides at the mullions.
- d: An incised horizontal line is visible at the total length of the W-wall, at the height of 1.64 m. This line was probably part of a preparatory design.
- e: Second building phase of the apartment complex (Soricelli 1995, 114-115).
- f: Soricelli 1995, 114-115.
- NB: In all zebrapatterns in the apartments of this complex, borders, always red or yellow, are painted over the black and white strokes.
- a: Pompeii VIII 2,17. Sarno Baths
- b: ramp [1], level 1-3 (fig. 16)
- c: *In situ* at the southern end on both walls (level 3),<sup>71</sup> and still visible at the northern end, at the entrance-stairway (level 1). The zebrapattern must have decorated the ramp for its full length, divided into panels by red bands (every 5 to 6 metres according to Koloski-Ostrow<sup>72</sup>). It looks the same as in corridor [35], displays the same colours and evenness.
- e: 62-79 AD (fourth construction phase after major damage; Koloski-Ostrow 1990, 51).
- f: Koloski-Ostrow 1990, 51, 63, 113 nr. 9, fig. 74; = *PPM* VIII, 103, fig. 11.
- b: corridor [35], level 3
- c: Zebrapattern, *in situ* at east end. The zebra-decoration is *in situ* on the S-wall in front of (and behind) a rubble wall which was constructed in the latest phase to block the way to the east wing of level 3,<sup>73</sup> or even after 1940.<sup>74</sup> We now see from left to right the remaining 58 cms of a panel showing strokes in X-shape, the opposite of the next panel with diamond shaped strokes. Next to this last panel there seems to be a blocked door, which marks the end of the pattern. The rest of the corridor to the right of this door and on the opposite wall, was decorated with black panels. The barrel vault shows a decoration of evenly spaced daisies (resembling stars), in red, yellow and green on a white ground.
- d: The red borders have been painted over the black and white strokes.
- e: 62-79 AD.
- f: Koloski-Ostrow 1990, 63, 114 nr. 11, fig. 75. In *PPM* VIII (p. 103) V. Sampaolo uses one indication (the Greek letter iota) for corridor [35] and ramp [1]. However she does not mention the zebra-design in this (part of the) corridor; neither does she mention the daisies/stars on the ceiling.
- a: Pompeii VIII A. Villa Imperiale
- b: stairway next to the Porta Marina (fig. 1)
- c: High zebrapanels along the stairs from the street to the porticus and in the stairway directly next to it, from the porticus to the upper floor. The top of the panels follows the inclination of the stairs. The width of the panels and the direction of the stripes vary,<sup>75</sup> but both are reflected in the opposite wall. The scheme is more or less based on an alternation of vertical stripes with diagonal stripes, stripes in triangular shape and stripes in V-shape; on the W-wall along the highest flight of stairs the vertical stripes also alternate with horizontally concave curves. The black stripes are mostly thicker than the white stripes, and all are rendered wavy. The upper zone and vault are white.
- f: Koloski-Ostrow 1990, pl. 76.
- a: Pompeii IX 13,1-3. House of C. Iulius Polybius (groundplan: fig. 18)
- b: fauces [3] and vestibulum [A] (fig. 19)
- c: The zebrapanels are combined with the remains of a First Style decoration in the upper zone, and a middle zone filled with a rough coat of white plastering. The panels rise from a black plinth, which is 0.30 m in height; in the fauces the height of the plinth decreases with the rising floor. The transition between the yellow bordered panels and the white plaster is marked by a black line; the transition to the plinth by a red line, as is used around the panels to embellish the yellow border. The zebra stripes are painted in alternating directions, with exceptions in the SE-corner, where the southernmost panel repeats the direction of the panel to its left as well as to its right, and on the N-wall. In the last case this exception, in the form of vertical strokes, seems to be made to fit the panels with vertical strokes in passage [E].
- d: Execution quite careless, many panels are a bit slanting (not all of them are perpendicular); in some of them the black dominates, in others the white; the diagonals of the various panels have different angles; on the western mullion of the fauces, the strokes end before they are even stopped by the border of the panel. Black and white paint are used at approximately the same time; on most panels it is visible that the white is overlapping with the black to make the transition softer.
- f: Leach 1993, 24; Leach, 1997, 54-55, fig. 6.4.
- b: passage [E]
- c: The panels of room [E] and the inner and outer sides of the corresponding mullions are different from the panels in the vestibulum and fauces. These are white panels on which black strokes are painted (now very much faded) and with simpler, red borders. The upper border is clearly applied for a second or third time (a secco).<sup>76</sup> Apparently this happened without renewing the zebrapattern, which is much more faded. The plinth rises together with the floor, at a constant height of 24 cm, (60 cm above the vestibulum floor), the panels rise in a less dramatic way.
- e: Restoration Fourth Style (*PPP* III, 571-572); in vestibulum and fauces probably after 62 AD; in room [E] probably older.
- f: *PPP* III, 571-572, 576; De Franciscis 1988, 18-19, fig. 4; Leach 1993, 24; Zevi 1996, 74.
- a: Stabiae, Villa of Ariadne (Campo Varano)
- b: corridor [26]
- c: Continuous pattern of stripes, 'waving' in all directions,<sup>77</sup> preserved on E-wall, north of the entrance to room [27] (L. 4.41 m) as well as on the remains south of this entrance; on W-wall, north of the entrance to room [28] (L. 4.08 m) as well as on the remains south of it, including the outside curve of laconicum [30].
- f: Unpublished.

#### TABLE

b.e. = border(s) excluded  
b.i. = border(s) included

N.B.: Pompeii I 11, 10-11 and VI 16, 26-27 (façade) are left out of this table; cf. catalogue.

Buildings	Zebropattern			Strokes		Borders		with thin line		Plinth	
	height in m	width in m (panels)	direction of strokes	width in cm	wavy or straight	width in cm	colour	width in cm	colour	height in m	colour &/ design
HERCULANEUM											
Palaestra	1.45-1.52	continuous	all directions and crossing $\backslash // \ / \backslash$	5-8	straight; bending		black upper border	-	-	-	-
III 19	1.92	continuous	diagonal $///$	6 (av.)	black straight; white wavy	-	-	-	-	-	-
OPLONTIS											
peristyle [32]	orthostates 1.22	0.54-0.83	diagonal $  //   \backslash  $	black dominant	$//$ straight; $\backslash$ wavy	3.5	yellow		white	0.36	red
	isodomes 0.35	0.82	diagonal; vertical; V-shape; triangle; double concave horizontal $[ \equiv \equiv ]$	white dominant	straight						
corridor [46]	1.56	1.38-2.30	diagonal; vertical $  //   \equiv   \backslash   \equiv  $	5	straight; $\equiv$ wavy	8-11	yellow	1	white	0.46	red with coloured stains
corridor [76]		depending of upper z.	diagonal; vertical $  \equiv   //   \backslash   \equiv   //  $		straight		yellow		white	?	red
passages east of space [86]			diagonal; V-shape; concave horizontal; diamond etc.	black dominant	wavy		red		white	-	-
<i>torcularium</i> [83]			double concave horizontal; double convex horizontal $  \equiv \equiv   \equiv \equiv  $		straight(?)		red	-	-		red
POMPEII											
I 12, 11 fauces [1]			diagonal $  //   //  $ in southern direction		wavy		red		white	-	black stripe
courtyard [2]	1.75	0.96-1.45 (b.e.)			wavy	5-6	red	0.5	white	-	
corridor [5]	1.75	0.72-1.05	$  \backslash   //  $ E-wall $  \equiv   //  $ W-wall		wavy	5	red	0.4	white	-	
room [7]	S-wall 1.67 (b.i.)	0.56-1.22	$  \backslash   //   \backslash   \equiv  $ (probably irregular)	black > white	wavy	5	red	0.5	white	-	
	N-wall 1.78	1.00-1.21									
II 4, 10 hortus façade	1.59	1.27-1.53	diagonal $  //   //  $	black 4-5; white 8-9	?	4-5	red	?	?	-	-
room [90b]	1.55	0.75-1.16	vertical	black 2.5; white 4	wavy(?)	5	red	-	-	-	-
latrine [89b]	1.53	?	vertical	cf. [90b]	?	cf. [90b]	red	-	-	?	?
Amphitheatre	1.33	continuous	diagonal $///$	black 8-9	straight	-	-	-	-	-	-
VI 16, 26-27 fauces [A]	1.92 (b.i.)	0.90-0.95	diagonal $  //   \backslash  $	6	wavy	5	red	0.5	white	-	-
VI 17, 42-44	stairway 1.31-1.59	continuous	all directions and crossing $\backslash // \ / \backslash$		straight; bending		black upper border	-	-	-	-
	N-wall 1.90	1.40	same, mainly $///$								

Buildings	Zebrapattern			Strokes		Borders		with thin line		Plinth	
	height in m	width in m (panels)	direction of strokes	width in cm	wavy or straight	width in cm	colour	width in cm	colour	height in m	colour &/ design
Stabian baths											
corridor [H]	1.77 (b.i.)	1.10-1.12; 1.33-1.40	vertical; diagonal alternating; V-shape; diamond shape	4-5	wavy	5	red	-	-	-	-
corridor [J]	2.00	0.89>0.74; 1.00	diagonal   \   \	black 2; white 5	wavy	5?	yellow	-	-	-	-
passage [N5]	1.95 (b.i.)	ca. 1.85	diamond shape		wavy	ca. 7	yellow upper border	-	-	-	-
latrine [O]	1.65	1.16- (1.43)-1.65	diagonal   //   \		wavy	ca. 5	yellow			-	-
Suburban baths										-	-
entrance [a]	> 2.26	1.10 (b.e.)	diagonal   //   \	3.5	wavy	5	yellow	-	-	-	-
stairway [b']	2.20	1.09-1.30 (b.e.)	diagonal   //   \	5-7	wavy	5-6 (corner 4+5)	red	-	-	-	-
corridor [22]	1.93 (b.e.)	continuous	diagonal, upwards in southern direction		wavy	ca. 5	yellow	-	-	-	-
passage [27]	2.02 (b.e.)	1.27 (b.e.)	diagonal, probably alternating	5-6	wavy	7 (corners 5+4.5)	red	-	-	-	-
entrance [12]	S-wall 2.60 (b.i.)	1.71 (b.i.)	vertical	black 3-6; white 6-12	wavy; very irregular	5-6	red	-	-	-	-
	N-wall appr. same as S-wall	0.97; 1.02 (b.e.); 0.28 (angle)	diagonal, different directions								
	W-wall [?]	0.66 (b.i.)	diagonal   \   \   \								
passage [13]	> 1.60	N-wall 0.92	faded (diagonal? \ \ \)	5-6	wavy	5	red	-	-	-	-
		S-wall 0.74-0.77									
corridor [34]	> 2.00	1.50 (b.i.)	diagonal   //   \	6	wavy	7	yellow	-	-	-	-
Sarno baths											
ramp [1]	1.35; 1.45	1.05	triangle; diagonal   \	8-10	wavy	vert. 6; upper 7	red	-	-	-	-
corridor [35]	1.60 (b.e.)	1.83 (b.e.)	diamond; X-shape	8-10	wavy	8	red	-	-	-	-
Villa Imperiale	1.90-2.00 (b.i.)	1.40 (b.i.)	diagonal; vertical; triangle; V-shape; convex horizontal   \   \   \   \   \   \   \   \	2-4	wavy	5	red		white	-	-
IX 13, 1-3	fauces 1.23-1.27	0.83	diagonal   //   \	black ca. 10-15; white ca. 6-10	wavy	3-4	yellow	1	red	0.30	black
	vestibulum 1.14-1.18	0.90-0.92									
IX 13, 1-3 passage [E]	1.16-1.32	0.90-0.93	vertical	10-15	wavy(?)	vert. + upper 4; lower 3-5	red	-	-	0.24	white
STABIAE											
Villa di Ariadne	> 1.97	continuous	all directions and crossing \ ( // ) ( \ // ) \		straight; bending	-	-	-	-	-	-



# NOTES

- \* This article originates in the research for my MA thesis on repetitive patterns, which I started in 1996. The last on-site investigations were carried out in 2000. Special thanks go to the many people that, in the meantime, have contributed to this article, either by helping me to prepare or carry out my investigations, by discussing the subject, or by reading and/or editing my English text: my adviser Eric Moormann; staff and visitors of the Netherlands Institute in Rome; staff and (former) PhD-students at the Archaeology departments of the University of Nijmegen (in particular Stephan Mols, Nathalie de Haan, and Gemma Jansen) and the University of Amsterdam (especially Herman Brijder, Olaf Borgers, Hendrieneke Maas, Vladimir Stissi, and Helle Hochscheid); the late professor J.A.K.E. de Waele and the members of his 1996 and 2000 Pompeii-team; and last but not least: Roald Docter, Brien Garnand, Theo Laken, Daniel Castor, Barbara Palmer, and Crispin Goulet. My research in Campania has been made possible by the Soprintendenza and *custodi* of Pompei, Herculaneum, Oplontis and Stabiae, for which I am very thankful. I am furthermore indebted to the foundations that have financed part of the project: Netherlands Institute in Rome; Reiman-de Bas Fonds, Hendrik Muller's Vaderlandsch Fonds; and Fundatie van de Vrijvrouw van Renswoude te 's Gravenhage.
- 1 E. La Rocca, M. de Vos, A. de Vos, *Guida archeologica di Pompei*, Verona 1976, 90.
  - 2 Cf. Wallace-Hadrill 1994, 44. Recently, C. Goulet has presented a paper on zebra patterns in and around Pompeii, at the 101<sup>st</sup> annual meeting of the Archaeological Institute of America (abstract: The 'zebra-stripe' design: an investigation of Roman wall painting in the periphery, *AJA* 104, 2000, 366-367). Her contribution was published when my paper was in print: C. Corrado Goulet, The 'Zebra Stripe' Design: An investigation of Roman Wall Painting in the Periphery, *RSt Pomp* 12-13 (2001-2002) 53-94.
  - 3 Thomas 1995, 157-159; cf. Strocka 1975, 101, Abb. 75; Wallace-Hadrill 1994, 39.
  - 4 Cf. Thomas 1995, 157.
  - 5 R. Thomas, however, compares them with a painting from the Roman province (Köln, Ins. H/1 of the CCAA) in which the pattern is used in a more elaborate decoration of panels divided by candelabra: R. Thomas, *Römische Wandmalerei in Köln*, 1993, 162-163, Abb. 54-55, Taf. 9; Thomas 1995, 237-238, 309, Abb. 165. According to Thomas (1995, 309) the pattern was copied from Italian examples and put into a system of panels and candelabra by the Cologne workshop. She dates the paintings to the late-flavian period (Thomas 1995, 238).
  - 6 For other repeating patterns in Campania, cf. L. Laken, Wallpaper patterns in Pompeii and the Campanian region: towards a Fifth Pompeian Style?, in *La peinture funéraire antique. Actes du VII<sup>e</sup> colloque de l'AIPMA*, 6-10 oct. 1998, *Saint-Romain-en-Gal – Vienne, sous la direction d'Alix Barbet*, Paris 2001, 295-300. A typological overview of all-over patterns in Roman painting was published by A. Barbet and V. Lanièce: *Imitations d'opus sectile et décors à réseau, essai de terminologie*, Paris 1997 (*Bulletin de liaison du Centre d'Étude des Peintures Murales Romaines* 12).
  - 7 Examples are: Herculaneum, Palaestra (Ins. Or. II); Pompeii, *Praedia Iuliae Felicis* (II 4,10); Amphitheatre (II 6); Casa del Bracciale d'Oro (VI 17,42); Stabian Baths (VII 1, 8); upper floor of the Suburban Baths (VII A, 2);

Sarno Baths (VIII 2, 17); House of C. Iulius Polybius (IX 13, 1-3) and the Villa Imperiale (VIII A); and most of the examples in the Villa of Oplontis.

- 8 At least, this is how the panels have been reconstructed after excavation (cf. catalogue).
- 9 For an overview of the four Pompeian Styles, see R. Ling, *Roman Painting*, Cambridge 1991, 12-100.
- 10 R. Thomas distinguishes 'Streifenmuster' from 'Wellenwischmuster': Thomas 1995, 157-159.
- 11 For instance V. Sampaolo, in *PPM* III, 230, 235, 278 (fig. 73, 80, 162), regarding the examples in II 4, 10; *La peinture de Pompéi* II, 245 (fig. 469), regarding the peristyle [32] in Oplontis; M. de Vos in *PPP* III, 21-22 and V. Sampaolo in *PPM* VI, 178-179 (fig. 49, 53), regarding the examples in VII 1, 8 [H+O]; V. Sampaolo in *PPP* III, 236, about VII (16.)A [a]; M. de Vos in *PPP* III, 572 (913030A08), about IX 13, 3. I. Bragantini consequently uses the formula 'marmo finto' (marble imitation), for example in the other descriptions of IX 13, 3 in *PPP* III, 571-572.
- 12 H. Eristov, *Corpus des faux-marbres peints à Pompéi*, *MEFRA* 91 (1979) 693-771.
- 13 V. Sampaolo in *PPP* II, 362, 363; and in *PPM* V, 891 fig. 1, 892-893 fig. 3-5.
- 14 E.M. Moormann, personal communication (December 1996).
- 15 The Casa a Graticcio in Herculaneum (III 13-15), for example, got its name from the timber framing (*opus craticium*) which was used for the building.
- 16 Maiuri 1958, 134.
- 17 Mainly V. Sampaolo and M. de Vos (see above). I. Bragantini has always used the term 'marmo finto' to describe the patterns, because according to her the pattern has its origin there, though she does not believe in an imitation of an existing marble (I. Bragantini, personal communication, June 2000).
- 18 In general, not only bardiglio, but also cipollino (Caristo marble) may have been a possible source of inspiration. Some examples of cipollino look like zebra patterns with straight stripes, although for the most part the thickness of dark and light veins is less even than in the painted patterns. They come from Euboia in Greece (see Gnoli 1971, fig. 204-205) and there is one from Carrara (Luna): cipollino carrarese, with the significant addition 'zebrino' (*I Marmi Italiani* [cf. note 20], fig. 56).
- 19 For example: bardiglio costa; bardiglio carrara chiaro; bardiglio imperiale; bardiglietto. Only bardiglio fiorito has got clear black veins, but these are criss-cross lines and are much too thin.
- 20 *I Marmi Italiani*, ed. Confederazione Fascista degli Industriali, Roma 1939, fig. 27; *Marmi Italiani - Guida tecnica*, ed. Istituto Commercio Estero, Roma 1982, nr. 32, p. 49 and nr. 18, p. 42; C. Hebing, *Marmor: 20 Marmor-Vorlagen in Farbendruck*, München (= Mappe-Mal-Vorlagen I), 17.
- 21 Pullen 1894, 54.
- 22 Some of these columns show a little bit more contrast, but are still not reminiscent of zebra decoration. Although the colour of the marble might have faded within 2000 years, the bardiglio slabs from more recent periods that have been used in the floor and dado of the Sala delle Muse, do not look more like zebra stripes. For those slabs, see P. Grazioli Medici, *Medici: marmorati romani*, Città del Vaticano 1992, 202-203.
- 23 As far as they are mentioned in the index of *PPP*: VI 1, 7 [43] (*PPM* IV, 35-37 fig. 60, 63, 64); VI 7, 23 [24] (*PPM* IV, 504 fig. 59).

- <sup>24</sup> Plinius, *Nat.Hist.* 36; Vitruvius, *De Arch.* 7.
- <sup>25</sup> Zebrapatterns can evoke several other, less obvious associations, which I would like to illustrate by reciting a series of freely made suggestions during a round table session with fellow-students: stonework, for example kerfs; animal skins; relief suggested by contrast between light and dark; wood; branches; and, very inventive: shadow play caused by a roof of reeds; or even more creative: a sundial.
- <sup>26</sup> Scagliarini Corlatta 1974-1976.
- <sup>27</sup> A painting very similar to the zebrapatterns found on façades (Pompeii II 4,10 and VI 16,26-27), but painted in other colours, can still be seen on the façade of house VIII 6,3, where at least three panels on each side of a blocked door to room [9] can be counted. Instead of the usual black and white stripes, panels of red vertical stripes are flanked by panels of yellow vertical stripes. The stripes are wavy. The panels have a red inner line, are framed by yellow bands, and are 1.27-1.30 m high. The main/upper zone was white. Cf. *PPM* VIII, 684 fig. 46.
- <sup>28</sup> Working spaces are to be classified as dynamic spaces, because there is a lot of movement within; unlike static spaces, where people sit or lie in one place, for example to rest, or to eat and drink.
- <sup>29</sup> Cf. Goulet 2000, 366.
- <sup>30</sup> S.C. Nappo in *PPM* II, 794. Since the neighboring courtyard [2], fauces [1] and a corridor or storage room [5] were also painted with a zebra design, it may be that a series of rooms on one side of this house were indicated by its decoration as a service quarter, as A. Wallace-Hadrill has proposed for the south wing of the peristyle in the Casa degli Amanti (Wallace-Hadrill 1994, 39-44).
- <sup>31</sup> Ch. Parslow in his excavation report of 1996 mentions that this room was in the last phase converted into an *andron* (*RStPomp* 7, 165). Parslow probably uses this Latin word (corridor, room between two walls) to indicate the new passage room, not to be confused with *andron* in the Greek sense (room for the men).
- <sup>32</sup> Parslow, *RStPomp* 7 (1995-1996), 162-165.
- <sup>33</sup> Cf. Wallace-Hadrill 1994, 39, fig. 3.5.
- <sup>34</sup> Jansen 1993, 30, 32.
- <sup>35</sup> Jansen 1993, 32.
- <sup>36</sup> Koloski-Ostrow 1990, 51.
- <sup>37</sup> Cf. Koloski-Ostrow 1990, 103-105.
- <sup>38</sup> Koloski-Ostrow 1990, 46-49.
- <sup>39</sup> For the building history of the apartments, see Soricelli 1995, 107-117.
- <sup>40</sup> Cf. Soricelli 1995, 115. Perhaps apartment B had been redecorated by the tenants themselves, since this is the biggest apartment. This would explain why zebrapatterns are missing in this apartment.
- <sup>41</sup> Goulet 2000, 366.
- <sup>42</sup> One of the exceptions is house I 12,11. It is not impossible that there were zebrapatterns in stairs and fauces (or on façades) of smaller houses, as for example VI 16,26, but these have disappeared.
- <sup>43</sup> Leach 1993, 23.
- <sup>44</sup> Cf. Leach 1997, 54-55. Interesting at this point is, that the façade of Herculaneum III 17, the Casa dell'Ara laterizia, which I could not include in my catalogue, had such a bench with a zebrapattern above it: a white dado with black diagonal stripes (as described by Maiuri, 1958, 420, fig. 360).
- <sup>45</sup> Leach 1993, 27.
- <sup>46</sup> De Franciscis 1988, fig. 15.
- <sup>47</sup> J.L. Franklin Jr., *Pompeii: The Electoral Programmata, Campaigns and Politics, AD 71-79*, Rome 1980 (Papers and Monographs of the American Academy in Rome 28), 68, 99-100, 112, 121.
- <sup>48</sup> Especially since V.M. Strocka has treated it in his article on the decoration of 'Nebenzimmer' (Strocka 1975, 102).
- <sup>49</sup> P.G.P. Meyboom, personal communication (June 1997; June 2000); Leach 1993, 24.
- <sup>50</sup> De Franciscis 1988, 18-20; Zevi 1996, 74.
- <sup>51</sup> For example Oplontis corridors [46] and [76] and in particular the passages east of [86].
- <sup>52</sup> Cf. Wallace-Hadrill 1994, 42 (subscription fig. 3.5).
- <sup>53</sup> Goulet 2000, 366-367.
- <sup>54</sup> Maiuri 1958, 332.
- <sup>55</sup> Cf. *La peinture de Pompéi* II, 245.
- <sup>56</sup> She indicates the peristyle by mistake as an atrium.
- <sup>57</sup> For the ceiling: see L. Fergola in *Pompeii: Abitare sotto il Vesuvio*, 137.
- <sup>58</sup> The fence painted on (the interior of) the N-wall could be of a later date - for example when room [5] was built. Jashemski only gives a description of the fence painting: Jashemski 1967, 43; 1993, 325.
- <sup>59</sup> A.O. Koloski-Ostrow in her dissertation (*The Sarno Bath Complex*, 1986, fig. 151) mentions a zebrapattern in this house, in a corridor east of the peristyle. In the final book about the Sarno Baths (1990) she has not included the photo - which is a pity because from the picture in the Xerox-copy of her dissertation hardly anything can be seen. She probably refers to the pattern in corridor/storage [5], which is in fact, following the Pompeian orientation, south of the viridarium/peristyle. There is however no description of this painting in neither *PPP* nor *PPM*. The only room of the ones having a zebrapattern, of which a photo (and description) has been published, is room [7], although according to the descriptions in *PPP* and *PPM* it should be an imitation of marble with grey veins.
- <sup>60</sup> Cf. S.C. Nappo in *PPM* II, 795.
- <sup>61</sup> Strocka (1975, 102) erroneously speaks of red stripes on a yellow ground, a mistake probably due to discolouring and fading of the paint.
- <sup>62</sup> Cf. *PPP* I, 232-233.
- <sup>63</sup> The other decoration displays Fourth Style.
- <sup>64</sup> See *PPM* V, 893 fig. 4-5.
- <sup>65</sup> Same combination as in Pompeii II 4,10.
- <sup>66</sup> Cf. Eschebach 1979, Taf. 24a.
- <sup>67</sup> Cf. *PPM* VI, 178 fig. 49.
- <sup>68</sup> Cf. *PPM* VI, 178 fig. 49.
- <sup>69</sup> M. & A. de Vos in Eschebach 1979, 95 (*CIL* IV 2124).
- <sup>70</sup> There is a diagonal strip of unplastered wall between the zebrapattern and the white upper zone belonging to staircase [b'], which is preserved up to the same level on the E-wall above that staircase.
- <sup>71</sup> In the table are given the height of the panels on the southern parts of the E-wall and W-wall respectively, and the width of the southernmost panel of the E-wall.
- <sup>72</sup> Koloski-Ostrow 1990, 113.
- <sup>73</sup> Koloski-Ostrow 1990, 29, 63.
- <sup>74</sup> *PPM* VIII, 103 fig. 9.
- <sup>75</sup> The panel's width given in the table was taken from the panel facing the entrance to the stairway from the porticus (easternmost panel on N-wall).
- <sup>76</sup> Especially clear on the W-wall on, and next to the mullion.
- <sup>77</sup> Like the zebrapattern in the Palaestra of Herculaneum.

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# Basilica sous le Haut-Empire Ambiguïtés du mot, du type et de la fonction

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## Résumé

Après avoir rappelé les difficultés épistémologiques de toute analyse diachronique d'un édifice aussi polyvalent que la basilique, dès lors qu'elle sort de son cadre habituel, celui du forum, l'auteur s'efforce de montrer que les normes mêmes de Vitruve, toujours invoquées au nom d'un fixisme typologique rassurant, sont plus souples qu'on ne l'admet généralement. L'étude des témoignages archéologiques ou épigraphiques relatifs aux 'basiliques' de théâtres, de sanctuaires et de thermes permet de mieux comprendre les projets d'Hadrien à Rome comme à Nîmes. Les transferts successifs des 'basiliques' dans des contextes où on ne les attendrait pas reflètent les transformations de la ville et la fluidité des lieux de la convergence populaire.

Dans un article récent, L. Ungaro appelait de ses vœux une étude systématique des emplois du mot basilique à l'époque impériale afin, disait-elle, de comprendre s'il pouvait aussi s'appliquer à des édifices n'appartenant pas à un forum.<sup>1</sup> Il est vrai qu'en dépit des études qui lui sont périodiquement consacrées, la *basilica* reste difficile à cerner dès lors qu'elle n'est pas *forensis*.<sup>2</sup> L'apparente clarté de sa définition traditionnelle est brouillée par la diversité des occurrences textuelles ou épigraphiques, et les rares vestiges qui pourraient lui correspondre suggèrent une polyvalence où se dissolvent toutes les certitudes relatives à sa morphologie et à sa fonction. Une telle situation qui heurte notre exigence de classification, fondée sur une fixité terminologique hors de laquelle toute recherche paraît vouée à l'échec, tient au fait que notre conception de l'urbanisme romain n'a pas encore vraiment intégré l'idée, fondamentale pour toute approche diachronique, que les lieux de la convergence populaire et, par voie de conséquence, le rôle et la situation de certains des principaux monuments profanes, se sont profondément modifiés au cours des siècles impériaux. Quand Ammien Marcellin désigne comme un endroit particulièrement fréquenté par la plèbe urbaine - *celebrem locum* - l'esplanade située devant le nymphée du *Septizodium* dans la proximité immédiate du Grand cirque, il donne à entendre que les vastes espaces du centre civique de Rome ont désormais perdu leur force d'attraction, au profit d'épisodes monumentaux à valeur strictement spectaculaire.<sup>3</sup> Certes l'*Urbs* n'est plus alors le siège du pouvoir impérial, mais le long processus au terme duquel se placent ces événements de 355 apr. J.-C. a commencé beaucoup plus tôt.

Les transferts successifs des 'basiliques' dans des contextes où on ne les attendrait pas et l'évolution corollaire de leurs fonctions reflètent mieux qu'aucun autre phénomène ces transformations de la ville, ou du moins la façon dont la majorité de ses habitants les a vécues.

Les apories impliquées dans la notion de basilique tiennent en fait beaucoup plus à nos habitudes épistémologiques qu'à la réalité antique, assurément complexe mais compréhensible malgré sa souplesse. S'il nous est si difficile d'en suivre les avatars monumentaux et fonctionnels, c'est paradoxalement parce que la basilique est l'un des rares édifices profanes pour lesquels nous disposons d'une définition théorique précise et de nombreux témoignages archéologiques qui illustrent cette définition.<sup>4</sup> D'où un repli général sur le texte et sur ses applications, et une difficulté d'autant plus grande à sortir de ce cadre à la fois contraignant et satisfaisant. Même en amont des pivots que sont la notice de Vitruve et les grandes basiliques du forum romain d'époque augustéenne, chacun cherche à en retrouver la trace: il suffit de rappeler les efforts quasi désespérés pour restituer des édifices 'vitruviens', c'est-à-dire à nef centrale couverte en lanterneau et à nefs latérales plus étroites, dans les premiers édifices de la série, les *basilicae Porcia* et *Semproniana*.<sup>5</sup> La façon dont on a souvent trituré ces pauvres vestiges du II<sup>e</sup> s. av. J.-C. pour qu'ils offrent déjà un schéma 'basilical', fût-il embryonnaire, n'a pas peu contribué à obscurcir le sens des normes du théoricien latin, lequel ne fournit, avec sa définition de la basilique 'normale', qu'un moment de l'évolution.<sup>6</sup> Vitruve invite d'ailleurs son lecteur à accueillir cette définition liminaire comme une

version possible - la plus répandue sans doute - mais non exclusive d'autres formules. D'abord il reconnaît implicitement que le schéma dit normal ne correspond déjà plus, en son temps, qu'à une sorte d'annexe couverte de la place publique, à la régularisation de laquelle elle contribue au même titre que les portiques périphériques.<sup>7</sup> Les singularités qui distinguent encore cet édifice de tout autre bâtiment civil et qui ont permis à M. Gaggiotti de lui restituer avec beaucoup de vraisemblance une origine ptolémaïque<sup>8</sup> ne trouvent plus guère aux yeux de Vitruve d'explication satisfaisante; on relève en particulier la faiblesse de la justification de la présence, sur le déambulatoire périphérique du niveau supérieur, d'une balustrade - *pluteum* - interdisant aux promeneurs tout contact visuel avec les négociants établis dans la nef centrale, *uti supra basilicas contignationem ambulantes ab negotiatoribus ne conspiciantur*.<sup>9</sup> pourquoi cette précaution? Pour éviter de distraire les manieurs d'argent et les commerçants dans leurs comptes ou dans leurs tractations? Mais ces gens exercent de toute façon leur activité au milieu des oisifs et des chercheurs de bonne fortune auxquels a toujours été ouvert le *spatium medium*. Le théoricien suggère en réalité, sans le dire, l'extroversion de la basilique de forum ouverte à ce niveau sur la place publique pour permettre à ceux qui le souhaitent d'assister éventuellement aux spectacles qui s'y déroulent.<sup>10</sup> Ensuite et surtout Vitruve propose un autre modèle de basilique, dont il est, dans le cas particulier de celle de Fano, le constructeur sinon l'inventeur; exemple unique dans l'ensemble des livres du *De architectura*, le paradigme normatif se trouve singulièrement altéré, immédiatement après son énonciation.<sup>11</sup> Autant dire que la rigueur morphologique du schéma initial n'est qu'apparente, même si la précision de la typologie l'emporte sur celle de la définition fonctionnelle; les archéologues et les historiens ont eu tendance à privilégier celle-là aux dépens de celle-ci, or c'est cette dernière, malgré le flou concerté de sa présentation, qui se révèle à l'examen comme le véritable élément qualifiant.

En raison même de la diversité des formes d'accueil offertes par la basilique de forum, et donc du caractère peu contraignant de son ordonnance interne, ce vaste hall était par nature adaptable aux contextes les plus variés. Même si, dans ses versions anciennes, elle semble avoir servi au moins à titre exceptionnel de siège à certains corps de magistrats comme les préteurs,<sup>12</sup> pour abriter ensuite des tribunaux permanents<sup>13</sup> et se plier aux impératifs du culte impérial,<sup>14</sup> elle apparaît d'abord conçue pour abriter un public dépourvu

de motivations précises. La tendance à la fermeture et à la monumentalisation, qui caractérise cet édifice comme tous les autres dès la fin de la République, ne l'empêche pas de rester fondamentalement destinée à répondre aux exigences de ce public, dans un monde où les valeurs sociales de la convivialité, du délassement et du spectacle l'emportent rapidement sur les préoccupations juridiques, administratives et civiques.

Les attestations littéraires du mot *basilica*, quand il s'applique à des réalités de l'architecture domestique, suivent une courbe sémantique qui peut aider à comprendre les transformations progressives du monument public correspondant: pour Vitruve, qui rédige son traité dans les dernières décennies républicaines, c'est-à-dire au moment où la personnalisation du pouvoir atteint son plus haut degré, les hommes de l'oligarchie sénatoriale, ou dans les municipes ceux du corps des décurions se doivent de posséder dans leur *domus* une basilique;<sup>15</sup> lieu alternatif, avec la curie ou le forum, de l'exercice réel des responsabilités politiques, elle est l'endroit où le *dominus* convoque et préside d'importantes réunions (*consilia publica*).<sup>16</sup> Bien vite cependant les banquets collectifs se tiennent, dans ces mêmes maisons, dans des salles pourvues d'un ordre intérieur et éventuellement d'une abside, qui prennent à l'occasion le nom de basiliques: la confusion entre *triclinium*, *cenatio* et *basilica* est dénoncée par Servius dans son commentaire de l'Énéide comme une pratique fréquente et, semble-t-il, déjà ancienne.<sup>17</sup> Ce remplacement de la délibération politique par la cérémonie conviviale, ou plus exactement ce transfert des réceptions clientélares dans les

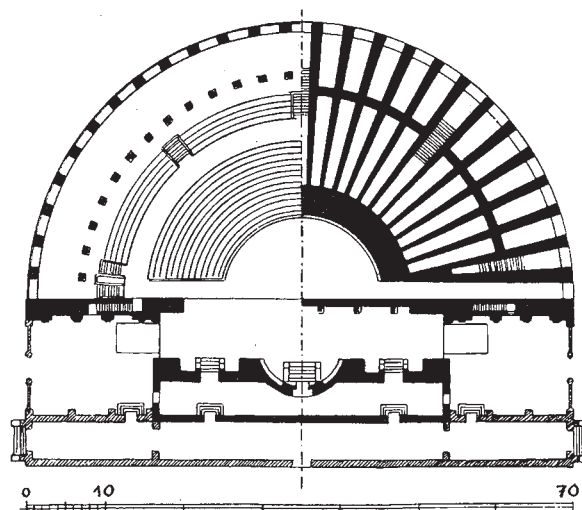


Fig. 1. Plan du théâtre de Gubbio.

espaces du *convivium* entraîne forcément des modifications des salles en question, quelque nom qu'on veuille leur donner, à cause en particulier de la recherche croissante de la mise en scène de la *dignitas* du maître de maison.<sup>18</sup> Plus tard encore, cet 'évergétisme d'usage' qui consiste à ouvrir une partie de sa demeure au public affectera également les aménagements thermaux, le *balneum* privé, qui comptait encore pour Vitruve au nombre des *loca propria*;<sup>19</sup> dans un codicille rapporté par le juriste Scaevola, un citoyen de Tibur lègue à ses concitoyens l'accès gratuit à ses bains, lesquels, précise-t-il, sont adjacents à sa maison (*iunctum domui*).<sup>20</sup> Un tel témoignage, malheureusement difficile à dater, est révélateur de l'intérêt croissant manifesté par le public pour les circuits thermaux, et l'on ne s'étonne pas dans ces conditions qu'un Sidoine Apollinaire finisse par désigner comme une *basilica* le *frigidarium* de la villa d'Avitacus.<sup>21</sup>

On comprend dès lors que l'analogie établie par Vitruve entre le salon de type égyptien, l'*æcus aegyptius*, et la basilique de forum ne correspond qu'à un moment de l'histoire du monument, aussi bien public que privé.<sup>22</sup> De ce schéma, qui garde le souvenir précis de la dérivation typologique dont le nom même, adjectif substantivé translittéré du grec, dit bien l'origine 'royale', Gaggiotti, nous l'avons rappelé, a su retrouver le cheminement et même l'occasion historique de son introduction à Rome, si du moins on admet avec lui que la *basilica Aemilia* de 179 av. J.-C. en constitue la première version avérée.<sup>23</sup> Les discussions et contre-propositions de F. Zevi et de K. Welch ont modifié quelque peu les raisons et les finalités de cette introduction, en essayant en particulier d'intégrer au processus la *basilica Porcia*, mais les circonstances et la signification des modalités de la constitution formelle restent pour l'essentiel recevables;<sup>24</sup> elles correspondent parfaitement à la phase d'hellénisation intensive et volontaire qui affecte dans le premier quart du II<sup>e</sup> s. av. J.-C. tous les aspects de la vie collective à Rome. Mais très vite des versions simplifiées ou différentes ont été mises en œuvre, comme par exemple les basiliques à deux nefs qui, à la fin de la République et au début de l'Empire, peuvent être observées à *Glanum*, à Zuglio, à Vidy, à Nyon ou à Conimbriga.<sup>25</sup> Souvent considérées comme des phases provisoires, ces formules, effectivement remplacées dans beaucoup de cas par des basiliques 'normales', n'en constituent pas pour autant un rameau mort de l'évolution; elles ne sont pas moins représentatives, du point de vue des choix typologiques, que les basiliques du genre de celles

de Veleia ou de Brescia, comportant une seule nef dont les murs sont rythmés par un ordre intérieur adossé, et qui sont restées en place jusqu'à la fin de l'Antiquité.<sup>26</sup> De ce point de vue l'accent mis sur le 'tradizionale Entwurfschema' par A. Nünnerich-Asmus dans sa riche et brillante synthèse est peut-être excessif; on le voit à la façon dont elle élimine par exemple de la catégorie basilicale l'édifice de Palestrina étudié et restitué par H. Lauter,<sup>27</sup> au prétexte que ses nefs d'égale largeur et ses trois niveaux de façade le désigneraient seulement comme une variante des 'stoai' hellénistiques;<sup>28</sup> en réalité il s'agit, comme l'a encore récemment montré F. Coarelli, d'une authentique basilique de forum, l'une des plus élaborées et des plus monumentales d'Italie centrale.<sup>29</sup>

Mais la diversité morphologique n'est pas seule en cause. Les potentialités contenues dans la notion même de *basilica* sont suggérées, au moment même où Vitruve publie son traité, par des édifices qui, pourvus d'une forme canonique ou pas, portent dans la tradition le même nom, bien qu'ils sortent du cadre où le théoricien avait voulu enfermer le type architectural.

Il s'agit d'abord de la *basilica* des bâtiments de scène des théâtres. L'une d'elles est précisément décrite, et mentionnée comme telle, dans une inscription bien connue de Gubbio:<sup>30</sup> un Gn. Satrius Rufus a payé la mise en place des caissons du plafond des 'basiliques' (*basilicas sublaqueavit*) et veillé à l'achèvement de ces annexes du *theatrum*; la mention d'un don de 7750 sesterces *in ludos victoriae Caesaris Augusti* indiquée dans le même texte semble se référer aux jeux célébrés en l'honneur d'Auguste après la bataille d'Actium. Il est donc légitime de dater l'opération, comme le propose D. Manconi, des années 27-25 av. J.-C.<sup>31</sup> Archéologiquement ces 'basiliques' sont identifiables, dans le monument de Gubbio, aux salles quadrangulaires qui occupent l'espace entre la scène proprement dite et la limite externe de la *cavea*; elles pouvaient accueillir les spectateurs entre les représentations ou abriter les accessoires et décors nécessaires au spectacle (fig. 1). L'exemple le plus remarquable de cette catégorie, celui qui en a sans aucun doute favorisé la diffusion est fourni par le théâtre de Marcellus à Rome: les fouilles les plus récentes ont montré que les grandes salles latérales attestées par la *Forma Urbis*, et aussi par des dessins du XVI<sup>e</sup> s., appartenaient au projet initial augustéen.<sup>32</sup> Certes nous n'avons aucune preuve qu'elles portaient le nom de *basilicae* dès cette époque, mais on voit mal pourquoi le même terme que celui utilisé à Gubbio ne leur aurait pas été appliqué, d'autant



que ses harmoniques 'royales' convenaient parfaitement au complexe du bâtiment de scène dont l'axe central était défini par la *porta regia*. De fait ces espaces rectangulaires absidés, couverts en voûtes d'arêtes, et dont les parois étaient constituées de piliers polylobés associés à des colonnes placées à peu de distance définissaient une relation entre l'intérieur et l'extérieur assez comparable à celle qui s'établit dans la basilique de forum 'normale'.<sup>33</sup> Si nous nous souvenons que le théâtre de Marcellus appartient à l'un des programmes les plus précoces du Principat, et que Vitruve en a forcément connu la mise en chantier, même s'il n'en a pas vu l'achèvement,<sup>34</sup> nous devons considérer que le théoricien latin a délibérément ignoré l'une des formes les plus monumentales et les plus officielles de la basilique, celle des théâtres, pour restreindre le champ sémantique du mot et cantonner les applications de la chose aux seuls centres civiques.

Dans le même temps, à quelques années près, un observateur aussi avisé des édifices les plus représentatifs de la romanité que Hérode introduisait au cœur de Jérusalem une somptueuse basilique (βασιλειος στοά) à la limite méridionale du 'péristyle des Gentils', au sud du péribole du Temple. La description qu'en a transmise Flavius Josèphe témoigne de la volonté de reproduire jusque dans le détail de leur ordonnance et de leurs proportions les *basilicae* de forum les plus accomplies;<sup>35</sup> malgré la longueur inusitée de l'édifice, d'environ 600 pieds, l'accentuation du *spatium medium* se trouvait préservée, puisque la nef axiale était une fois et demie plus large que les nefs latérales. Sensible à la majesté de ce genre de composition, dont la couverture centrale s'élevait au-dessus d'un puissant attique rythmé par des pilastres supportant un entablement, et où l'éclat des marbres suscitait l'admiration de quiconque s'en approchait, Hérode a voulu de toute évidence se ménager ainsi un monument qui, sans porter directement ombrage à la sacralité du lieu, pût en faire bénéficier celui qui y organiserait des liturgies pour exalter son propre pouvoir.<sup>36</sup> Jaloux des acclamations populaires dont le Grand prêtre était l'objet lors de la 'Fête des tabernacles', le roi protégé d'Auguste annexait à son usage personnel un 'portique royal' qui, au dire de Flavius Josèphe, comptait au nombre des réalisations les plus éclatantes de la capitale hérodiennne. Ce faisant il mettait en place sans le savoir le prototype de ces basiliques de sanctuaires qui, à Rome et dans les provinces occidentales, allaient se multiplier sous des formes diverses aux II<sup>e</sup> et III<sup>e</sup> s. apr. J.-C. À vrai dire il n'avait fait qu'exploiter par

anticipation les harmoniques sacralisantes d'un édifice dont le culte impérial allait rapidement investir les annexes juridiques puis les axes principaux, selon un système univoque de référence à la légitimité de l'empereur et de sa famille.<sup>37</sup> Quelques décennies plus tard, la basilique de l'agora civique d'Ephèse, inaugurée en 11 apr. J.-C. par C. Sextilius Pollio, dominera d'une façon tout aussi impérieuse la place publique principale de la capitale de l'Asie, qui servait également de cadre au premier sanctuaire dynastique de la ville.<sup>38</sup>

Les clés pour comprendre les raisons de cette homonymie entre les annexes traditionnelles du forum, celles du bâtiment de scène et celle des sanctuaires nous sont en fait données par Vitruve lui-même, pour peu qu'on fasse de ses livres III à V une lecture globale et non pas, comme il arrive trop souvent, attentive seulement à l'énoncé d'une règle ou d'un rapport modulaire. D'une part il montre bien, avec l'exemple de sa basilique de Fano, que désormais la *basilica forensis* aura vocation à accueillir les images sacralisées du pouvoir; d'autre part l'importance qu'il accorde au théâtre et à ses dépendances, auxquels il consacre des développements aussi longs que l'ensemble du livre III relatif aux temples témoigne du fait qu'il est parfaitement conscient de la place occupée dans le nouvel urbanisme par l'édifice de spectacle qui est, avec les sanctuaires poliades ou dynastiques, le second pôle de la ville. Et ce n'est assurément pas un hasard si la *porticus post scaenam* à double nef apparaît conçue par le théoricien comme l'annexe couverte de la *cavea*: 'derrière la scène, il convient d'édifier des portiques afin que les spectateurs puissent s'y réfugier quand des pluies soudaines interrompent la représentation';<sup>39</sup> les prescriptions relatives au rapport entre la hauteur des colonnes et la largeur du promenoir, celles qui concernent l'ordre ionique des colonnes axiales de la *porticus duplex* sont analogues aux normes énoncées quelques chapitres plus haut pour les forums.<sup>40</sup> Or les salles latérales ci-dessus mentionnées du bâtiment de scène du théâtre de Marcellus sont à la fois le prolongement et l'élargissement de ces portiques situés *post scaenam*, et en amplifient la fonction d'abri mais aussi de lieu de passage ou de séjour entre l'extérieur ou l'intérieur. Au moment où nous la rencontrons la 'basilique' théâtrale est exactement comme la basilique de forum à la fin de la République en ce qu'elle présente seulement sur sa limite des piliers qui en rythment les façades, mais sans parois véritables; l'une des opérations financées par l'évergète de Gubbio a précisément consisté

à clore les *basilicae* du théâtre au moyen de balustrades à hauteur d'appui.<sup>41</sup> Nous assistons ainsi à un processus de définition monumentale analogue, toutes proportions gardées, à celui que décrit Vitruve avec la fermeture périphérique de la basilique de Fano.<sup>42</sup> Cette phase de définition d'un 'Innenraum', caractéristique des premières décennies du Principat pour les grandes basiliques de forum,<sup>43</sup> serait sans doute observable, selon des modalités assez voisines, dans les 'basiliques' de théâtre s'il nous restait davantage d'éléments pour en juger; de fait les magnifiques salles latérales du théâtre d'Orange, réalisées sinon conçues à l'époque de Tibère ont toute la *dignitas* d'un monument à part entière.

Là ne s'arrêtent pas les analogies. La *porticus post scaenam* du théâtre de Mérida confirme le parallélisme de l'évolution entre les structures d'encadrement du forum et celles du péristyle situé derrière la scène.<sup>44</sup> Le portique double qui limite au nord celui de la capitale de la Lusitanie s'ouvre sur un *sacellum* en position axiale remarquablement étudié par W. Trillmich, et qui est resté consacré à Auguste et aux membres de sa famille en dépit des modifications et 'mises à jour' opérées durant le Haut-Empire;<sup>45</sup> il s'agit vraiment d'une *aedes Augusti* qui par sa forme et sa position évoque directement celle de la basilique de Fano et de plusieurs autres conçues selon le même modèle. On relève en particulier que les entrecolonnements centraux du double portique antérieur ont été élargis pour favoriser la vue, depuis le *sacellum*, à travers toute l'aire centrale, vers la *porta regia* du front de scène, comme dans la basilique vitruvienne ont été supprimées deux colonnes de la péristasis interne pour ménager un couloir visuel, à travers la place du forum, vers le temple de Jupiter.<sup>46</sup> Rien ne suggère mieux l'importance désormais concédée au théâtre:<sup>47</sup> les élites de la période julio-claudienne ne s'y trompent pas, qui auront à cœur de placer leurs effigies et leurs inscriptions honorifiques à l'intérieur de la *porticus post scaenam* plus volontiers parfois que sur la place publique traditionnelle.<sup>48</sup> Le portique double qui limite au nord le péristyle qui jouxte le théâtre de Mérida revêt ainsi l'aspect mais aussi, dans une certaine mesure, le rôle d'une véritable basilique à deux nefs pourvue d'un petit sanctuaire dynastique.

En tant que structure organiquement liée à un centre de convergence populaire, qu'il soit civique, ludique ou religieux, la basilique est donc adaptée à toutes les situations urbanistiques qui requièrent un endroit couvert *quo populus se recipiat*.<sup>49</sup> Contrairement à l'opinion reçue, le phénomène se mani-

feste, comme nous venons de le voir, dès le début du Principat. Mais c'est au cours du II<sup>e</sup> s. que la ductilité fonctionnelle de l'édifice et les contenus du mot qui le désigne acquièrent leur plus grande efficacité et, par voie de conséquence, leur plus grande diversité. Une telle situation peut sembler paradoxale quand on sait la renommée acquise par la *basilica Ulpia* sur le Forum de Trajan, qui exprime d'une façon incomparable les ressources du modèle canonique de la basilique de forum, porté à son plus haut degré de luxe et de monumentalité.<sup>50</sup> La descendance provinciale de cette prestigieuse réalisation urbaine est abondante, même si on lui a prêté dans certains cas une influence excessive.<sup>51</sup> Mais après cette ultime illustration, la notion de *basilica* paraît perdre une part de sa spécificité puisque le mot s'applique à des catégories très différentes et faiblement individualisées. Toute salle de quelque ampleur, pourvu qu'elle appartienne à un complexe public, profane ou sacré, peut prétendre à ce titre. Mais - et ce n'est pas l'aspect le moins intéressant d'un processus de diffusion en apparence peu significatif - cette présence d'une basilique, quelque forme qu'elle revête, dans des contextes où on ne l'attend pas, fait participer ceux-ci du prestige inhérent à ses harmoniques sémantiques et aux images que le mot évoque immanquablement dans la mémoire collective.

Un exemple démonstratif est celui des 'basiliques' de Matidia et de Marciana. Certes, l'attestation tardive de ces deux monuments, connus seulement à travers les Régionnaires et une source littéraire du IV<sup>e</sup> s., peut susciter quelques réserves sur la pertinence de leur dénomination.<sup>52</sup> Mais il est probable que cette synecdoque topographique et onomastique, qui consiste à désigner le tout par la partie - en l'occurrence les portiques à deux niveaux superposés qui encadraient le temple de Matidia, la belle-mère d'Hadrien, et dont l'image nous est conservée sur un revers monétaire des années 120-121 apr. J.-C. ait été pratiquée à une date relativement haute.<sup>53</sup> La *basilica* retrouve ici son sens originel, conservé du reste dans les villes orientales de l'Empire, qui est celui d'un portique plus ou moins développé.<sup>54</sup> Et de toute façon l'association d'une basilique à un sanctuaire n'était pas chose nouvelle, comme l'atteste l'exemple du 'péristyle des Gentils' à Jérusalem, que nous avons rappelé plus haut. À quoi s'ajoute le fait que ces places du Champ de Mars organisées autour d'un temple du culte dynastique revêtaient aux yeux de la population une signification religieuse assez faible, et en tout cas rapidement dévaluée; en revanche leurs porti-

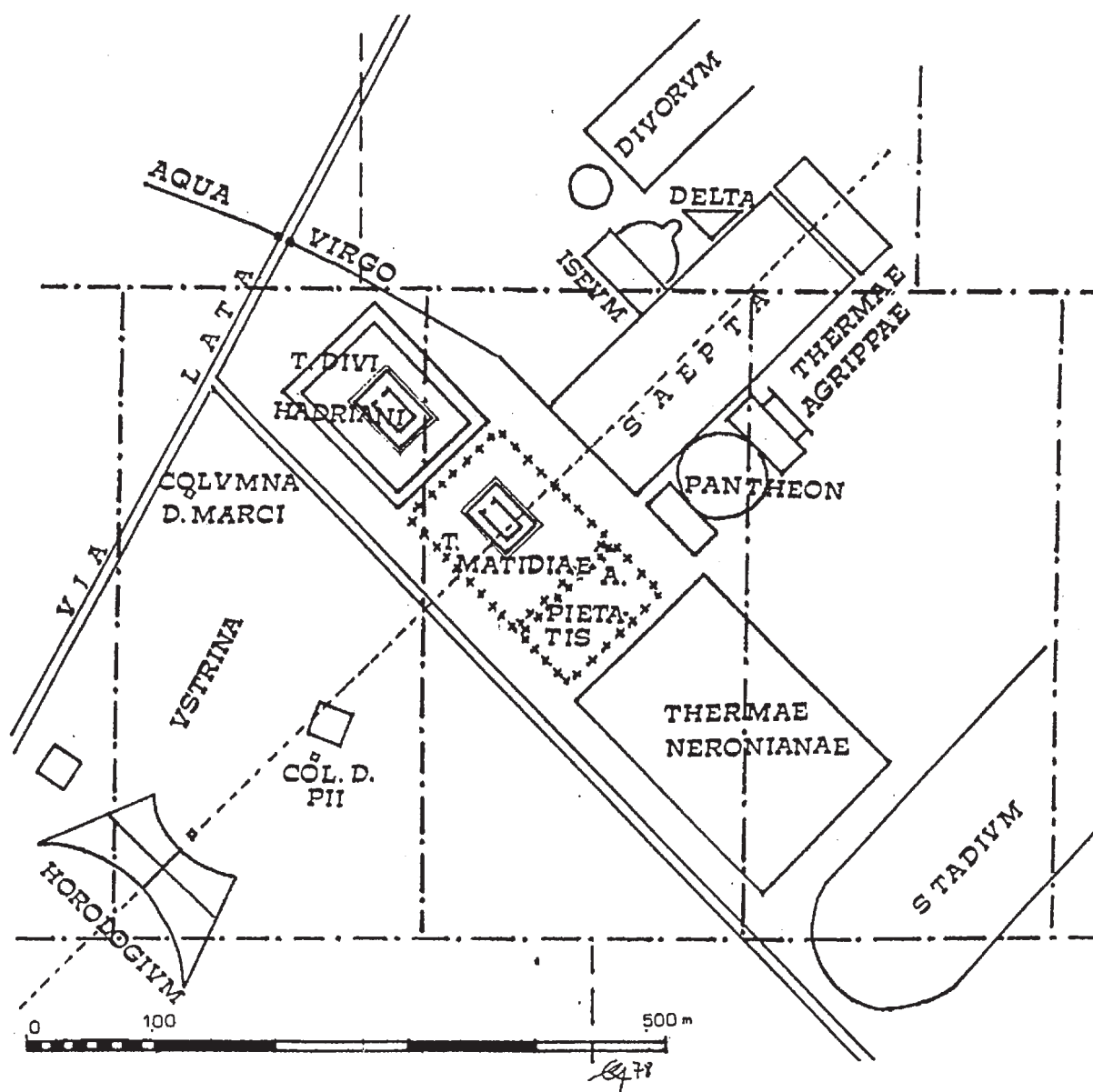


Fig. 2. Localisation du temple de Matidia selon E. Rodriguez Almeida.

ques latéraux assumaient, dans cette partie de la nouvelle Rome monumentale, une fonction importante de lieu de promenade ou de rencontre, et contribuaient au déplacement progressif des centres du pouvoir et des affaires caractéristique de la période antonine (fig. 2).<sup>55</sup>

Si l'on conservait quelque doute sur la définition et la fonction basilicales de ces portiques, il suffirait pour les lever de mentionner les inscriptions qui aux II<sup>e</sup> et III<sup>e</sup> s. évoquent dans les provinces occidentales des *basilicae* en relation directe avec des sanctuaires, en général voués au culte impéri-

al: dans les Gaules, à Périgueux, Vendœuvres-en-Brenne, Vandœuvre du Poitou, Bourbon-Lancy,<sup>56</sup> dans l'Afrique proconsulaire, pour ne citer qu'un exemple, à Thignica, où une épigraphe retrouvée en 1991 décrit avec précision les composantes d'un complexe religieux, *aedes, basilica, porticus, custodia*, etc.<sup>57</sup> Il est assurément toujours difficile d'identifier sur le terrain les basiliques en question qui peuvent être des salles isolées, absidées ou non, des portiques simples ou doubles, etc. Le seul invariant est à chercher dans la position secondaire ou subordonnée par rapport au temple de ces espaces



couverts, qui sont reliés à l'ensemble de façon à servir d'annexe liturgique, d'encadrement architectural, ou d'entrée plus ou moins monumentale. La typologie dans ces divers cas n'est évidemment plus le critère discriminant. Il n'en reste pas moins que certaines basiliques de sanctuaire conservent des traits caractéristiques du schéma 'vitruvien': le gigantesque téménos de l'Olympiéion d'Ephèse, entouré de portiques, possédait sur sa façade méridionale, vers les thermes et le gymnase du port, un immense vaisseau basilical constitué de trois nefs définissant un *spatium medium* nettement plus large que les espaces latéraux, et pourvu à ses extrémités de vestibules ou *chalcidica*;<sup>58</sup> transformé en une église consacrée à la Vierge au cours du V<sup>e</sup> s., cet édifice construit à l'époque d'Hadrien rappelle, par sa situation et son plan, celui dont Hérode, près d'un siècle et demi plus tôt, avait doté l'esplanade du Temple à Jérusalem.<sup>59</sup>

Ces observations devraient nous aider à comprendre ce que fut la *basilica Plotinae*, élevée à Nîmes à l'instigation d'Hadrien en l'honneur de son épouse. Les deux sources qui en parlent sont trop peu précises pour autoriser une localisation assurée. Dion Cassius évoque seulement un temple (ναός) sans même indiquer la ville où il s'élevait;<sup>60</sup> seul le rapprochement avec la notice de la *Vita Hadriani*, de l'*Histoire Auguste*, autorise à considérer qu'il s'agit d'une fondation identique à celle de la basilique de Plotine.<sup>61</sup> Des chapiteaux marmoréens qui, par leur type et leur facture appartiennent à la même série que ceux provenant de la 'basilique de Neptune' à Rome,<sup>62</sup> ont été recueillis au XVIII<sup>e</sup> s. dans la zone du 'Jardin de la Fontaine' de Nîmes, où j'ai cru pouvoir reconnaître naguère l'*Augusteum* de la ville, en soulignant l'activité qui s'était déployée sur ce site dans le premier tiers du II<sup>e</sup> s (fig. 3).<sup>63</sup> Plutôt qu'à un temple, curieusement situé à l'orée même du sanctuaire, comme l'avait proposé R. Naumann,<sup>64</sup> ces magnifiques éléments architectoniques nous semblent devoir être attribués à un propylon en forme de salle hypostyle, dont les fondations ont été effectivement observées sur l'axe de l'entrée. Ce propylon, compte tenu de ce que nous savons aujourd'hui, peut fort bien avoir reçu le nom générique de *basilica*, en ce qu'il occupe l'une des positions fréquemment concédées aux 'basiliques' de sanctuaires. Dans ce contexte, la notice elliptique de Dion Cassius n'invalide pas l'hypothèse; elle confirme plutôt, comme nous l'avons vu à propos du temple de Matidia, qu'une confusion pouvait s'établir entre *aedes* et *basilica*, d'autant plus aisément dans le cas du monument nîmois que cette dernière était dédiée sinon consacrée à

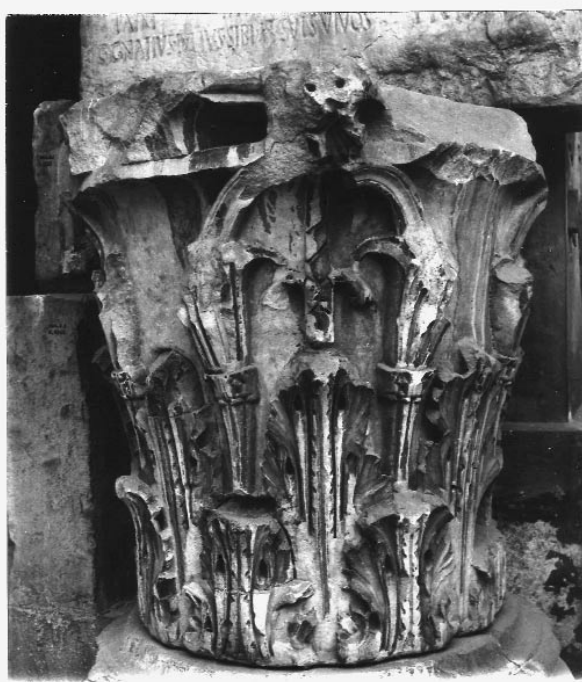


Fig. 3. Chapiteau de Nîmes (Jardin de la Fontaine). Cet élément pourrait provenir de la basilica Plotinae.

un membre éminent de la *domus imperatoria*. La présence d'une basilique à l'entrée du 'Jardin de la Fontaine' paraît à vrai dire d'autant plus vraisemblable qu'on observe sur ce site une accumulation croissante d'inscriptions et de dédicaces honorifiques, qui permet de suivre avec une relative précision les modalités du transfert effectif sinon officiel du centre civique de *Nemausus* depuis le forum augustéen, dominé par la 'Maison Carrée', vers l'*Augusteum*.<sup>65</sup> En somme, ici comme dans le cas des théâtres au début du Principat, la basilique suit, avec des péripéties qui peuvent être variées, les définitions successives des 'lieux du consensus', eux-mêmes liés à la politique édilitaire impériale et à ses incidences sur la vie des collectivités municipales ou coloniales.

Or à cet égard aucun complexe monumental n'a exercé, dès le début de la période hadriano-antonine, une attraction plus grande que les thermes.<sup>66</sup> Coarelli a encore dernièrement souligné qu'on ne pouvait expliquer les caractères structurels de la basilique de Maxence sans se référer aux salles centrales des établissements thermaux antérieurs ou contemporains.<sup>67</sup> C'est exact, mais il importe de comprendre pourquoi ces derniers ont joué dans l'évolution formelle du type basilical et dans l'enrichissement sémantique du mot *basilica* un rôle aussi décisif. Il semble en fait que se soit

d'abord produite une intégration de la basilique dans les thermes impériaux: ces véritables palais du peuple, dont la fondation trajanienne constitue le prototype et qui n'allaient cesser de se développer et de se raffiner jusqu'au règne de Dioclétien sont devenus, au long des II<sup>e</sup> et III<sup>e</sup> s., les lieux de prédilection de la plèbe urbaine;<sup>68</sup> l'épigraphie fait état dans le même temps de véritables basiliques thermales, qui correspondent le plus souvent aux salles froides (*frigidaria*) mais peuvent aussi désigner des *apodyteria* ou plus rarement des *tepidaria*.<sup>69</sup> Une inscription restituée par J. Reynolds autorise à postuler l'existence, dans les thermes dits d'Hadrien, à *Aphrodisias* de Carie en Asie Mineure, d'une structure basilicale dont les évergètes qui se targuent de l'avoir construite ou achevée ne nous donnent malheureusement aucune définition fonctionnelle mais dont la mention apparaît comme l'une des plus anciennes en un contexte thermal.<sup>70</sup> Et Lucien, dans l'opuscule intitulé *Hippias ou le bain*, décrit une salle, sans doute un *frigidarium*, dont l'ampleur, les facultés d'accueil et l'agrément rappellent à s'y méprendre les caractères propres aux basiliques traditionnelles, même si le mot n'est pas prononcé: 'Ensuite vient une salle, la plus belle de toutes, la plus confortable pour s'y tenir debout ou assis, la plus sûre pour s'y attarder, la plus commode pour y évoluer.'<sup>71</sup>

Ces salles n'entretenaient plus évidemment aucune relation formelle avec les basiliques antérieures, dont l'un des invariants spécifiques était, sans exception, d'être hypostyles. Certes nous avons déjà rencontré une catégorie basilicale, celle des théâtres, où le recours à la voûte semble avoir été aussi précoce que fréquent. Mais la substitution d'un espace interne sans supports libres intermédiaires pourvu d'une couverture en voûtes d'arêtes ou en calottes hémisphériques, au modèle parfaitement accompli et doté de tous les prestiges de la grande architecture de représentation qu'était le type basilical à charpente triangulaire sublimé par la *basilica Ulpia*, ne s'explique pas seulement par l'évolution des techniques de construction et la libération des formes qu'elle a autorisée. Au principe de la déambulation périphérique entretenu dans les basiliques précédentes par les nefs bordées de colonnades parallèles, qui suscitent des perspectives souvent très allongées, se superpose désormais, comme valeur essentielle de la spatialité intérieure, la libération d'une aire aussi vaste que possible, centralisée et exaltée par l'élan des voûtes en *opus caementicium* et le chatoiement de leurs caissons rhomboïdaux. La réalisation la plus accomplie de ce type monumental est sans

doute celle du *frigidarium* des *thermae Antoninianae*: avec ses trois puissantes voûtes d'arêtes qui reposent sur huit colonnes adossées à la muraille, laquelle fait office de contrefort, il présente le modèle parfait de la nouvelle 'basilique thermale'.<sup>72</sup>

Ce schéma qui atteint en ce début du III<sup>e</sup> s. la perfection, mais dont on connaît de nombreuses applications antérieures, n'est pas seulement la résultante d'une série d'évolutions techniques et formelles; il correspond aussi à une conception en grande partie nouvelle de l'architecture, inséparable de la dérive monarchique du pouvoir amorcée sous Domitien et confirmée par Hadrien, qui tend à instaurer avec le cadre construit une relation du public où la passivité admirative l'emporte sur la participation. La bienfaisance omniprésente de l'Empereur, transcendant les anciennes typologies, investit tous les monuments publics, qu'ils soient profanes ou sacrés, en suscitant partout, avec des moyens analogues, un sentiment diffus de sacralité par le truchement des deux caractéristiques complémentaires que sont la sacralité et l'exaltation de la dimension verticale.

Certes les grands témoins de l'architecture hypostyle à charpente de comble bénéficient toujours d'un prestige rémanent. Ils continuent à susciter l'admiration de qui pénètre dans leurs immenses vaisseaux, comme le rappelle dans les années 70 apr. J.-C. un Plinius l'Ancien qui compte encore la *basilica Aemilia* au nombre des plus belles réalisations que l'univers ait jamais connues.<sup>73</sup> Et le modèle reste vivant de ces basiliques romaines comme le prouvent l'immense construction antonine de la haute ville de Carthage<sup>74</sup> et la basilique sévérienne de *Lepcis Magna*.<sup>75</sup> Mais la splendeur du vide cerné de murs revêtus des marbres les plus divers et animés par les ordres décoratifs, couronné de voûtes qui prolongent vers le haut le discours de la magnificence est désormais le signe le plus tangible de la *maiestas imperii*. Un fait emblématique de ce tournant décisif peut être trouvé dans l'usage qu'Hadrien semble avoir souvent fait du Panthéon, si l'on en croit Dion Cassius selon qui l'Empereur se plaisait à administrer la justice en siégeant au centre de cette vaste rotonde;<sup>76</sup> selon l'historien grec, en général sensible aux harmoniques divinisantes des comportements des responsables romains, le Panthéon faisait alors fonction de *basilica forensis*, à la manière de l'*Aemilia* ou de l'*Ulpia*, avec ses tribunaux permanents et ses cours temporaires. En d'autres termes l'*aula regia* pour cet Empereur n'était plus, ou en tout cas plus seulement la 'basilique' du palais de Domitien, mais aussi le Panthéon lui-même, à

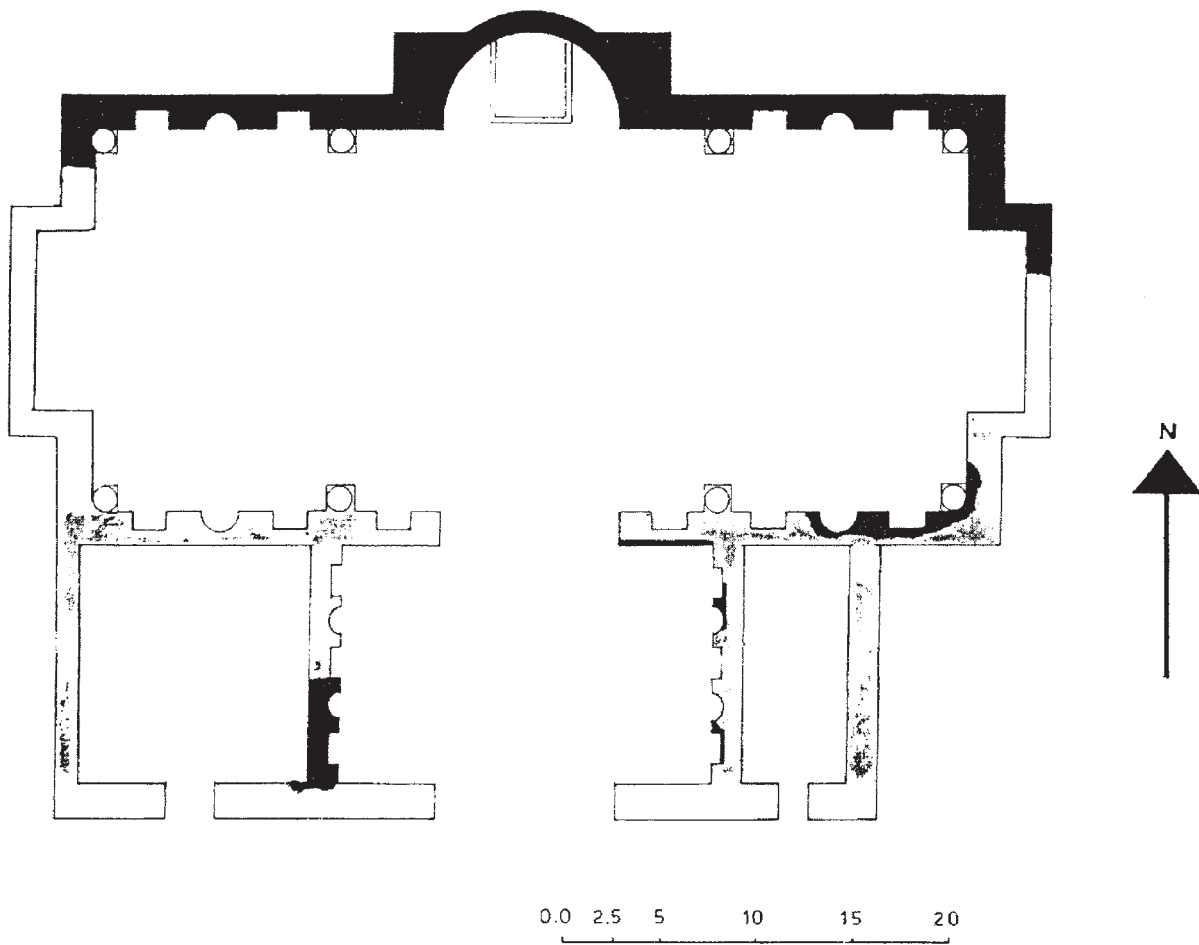


Fig. 4. Plan de la basilica Neptuni, d'après G. Ghini.

la fois temple et salle du trône.<sup>77</sup> Dans cet édifice d'un genre nouveau l'unique espace basilical au sens vitruvien du terme était le *pronaos*, avec ses trois nefs et la nette accentuation de son cheminement central, le seul qui propose un parcours axial vers la porte du sanctuaire. Mais la 'basilique', ou plutôt sa citation formelle, n'était plus le cœur de l'édifice; elle en constituait seulement l'antichambre.

Une basilique, nommément désignée, existait pourtant, en pleine continuité structurelle avec le Panthéon, c'était la *basilica Neptuni*. La *Vita Hadriani* en présente la reconstruction totale par l'Empereur philhellène, dans le même programme que celle du Panthéon et des *Saepta*;<sup>78</sup> la même relation entre les trois opérations s'observe dans la notice de Julius Africanus, lequel, c'est vrai, n'évoque pas la basilique mais parle seulement d'une bibliothèque, ce qui peut être un moyen de désigner l'édifice par l'une de ses fonctions.<sup>79</sup> Quoi qu'il en

soit la basilique de Neptune, qui a sans doute pris la place du ποσειδώνιον d'Agrippa<sup>80</sup> semble avoir, dans son extension complète, occupé un espace quadrangulaire de 45 x 20 m, avec une ample abside axiale au centre de son mur nord, et une niche rectangulaire sur ses parois latérales; huit grandes colonnes adossées supportaient un entablement orné de la fameuse frise des dauphins.<sup>81</sup> Sa couverture consistait en une triple voûte d'arêtes. En l'absence de toute trace d'une relation directe avec les thermes d'Agrippa qui s'élevaient à peu de distance vers le sud, même si des recherches récentes ont pu identifier sur sa face méridionale un avant-corps en forme de vestibule, la fonction thermique de cette salle, en dépit de sa parenté évidente avec diverses composantes des complexes balnéaires, paraît devoir être exclue.<sup>82</sup> L. Cordischi propose avec raison d'écarter également toute fonction religieuse. Reste donc la fonction ou plutôt les fonctions pro-



prement basilicales de lieu de rencontre, de centre d'affaires et aussi éventuellement si l'on admet que les niches latérales aient pu abriter des étagères pour *volumina*, d'endroit réservé au moins sur une partie de sa surface à la lecture d'ouvrages ou à la consultation d'archives. La *basilica Neptuni* apparaît ainsi comme la plus ancienne, et déjà l'une des plus accomplies des basiliques civiles où la nouvelle architecture 'thermale' ait été mise en œuvre (fig. 4).

À ce point de la réflexion, une question ne peut manquer de se poser. Que faisait-elle au cœur du Champ de Mars, et à quel ensemble monumental se rattachait-elle?

Il a souvent été constaté dans le passé, et l'on s'en est parfois étonné, qu'Hadrien, grand constructeur, n'ait réalisé à Rome aucun forum impérial.<sup>83</sup> La raison invoquée de cette absence, celle du manque d'espace au terme de la séquence achevée par son prédécesseur Trajan au prix de travaux d'arasement très importants, ne semble pas recevable, dans la mesure où déjà les centres de la convergence populaire s'étaient déplacés vers l'ouest. Nous pensons en réalité que le forum d'Hadrien est à chercher dans cette reconstruction grandiose et concertée des trois édifices ci-dessus mentionnés qui ne présentent pas seulement une remarquable continuité topographique, mais s'inscrivent aisément dans un programme civique et religieux: composé d'un temple dynastique assumant occasionnellement mais d'une façon très significative le rôle d'une *aula regia*, d'une basilique au sens traditionnel sinon formel du terme, et d'une place énorme, ce programme rassemblait les monuments complémentaires adaptés aux différentes fonctions d'un forum impérial. Du point de vue de la monumentalité et de la superficie, ce forum occupe même la première place parmi tous ceux qui avaient été réalisés auparavant, y compris celui de Trajan. Deux éléments nous paraissent confirmer cette hypothèse, en ce qu'ils assurent l'unité organique du complexe: c'est d'abord le portique des Argonautes, qui règne sur la limite orientale du Panthéon et de la basilique, et constitue la frange occidentale des *Saepta*, établissant ainsi une continuité structurelle et monumentale entre les trois composantes.<sup>84</sup> C'est en second lieu le grand portail axial ouvert à l'est du quadriportique: cet 'arco sopra Minerva' ou 'giano accanto alla Minerva', selon les dénominations médiévales ou renaissantes, s'ouvrait au milieu du portique oriental des *Saepta*, la *porticus Meleagri*;<sup>85</sup> toujours désigné comme l'entrée occidentale du Sérapéum et mis au compte de l'intérêt manifesté par Hadrien à

l'égard de la religion égyptienne - lequel n'apparaît du reste qu'après 130 - ce puissant *quadrifrons* dont la mise en place est forcément contemporaine de la réfection globale des *Saepta* fonctionnait aussi et, croyons-nous, plutôt comme l'entrée solennelle de la grande place qui s'ouvrait derrière lui. Sa situation axiale contribuait à l'unification de l'ensemble, et il devait reproduire sous une forme amplifiée les structures d'accès, malheureusement disparues, des différents *fora* de la séquence impériale. Observés par Antonio da Sangallo le Jeune, ses vestiges furent détruits en 1872, mais R. Lanciani avait pu déduire la période de sa construction des estampilles sur briques datées de 123, et G. Gatti en a proposé une restitution en plan et en élévation pleinement vraisemblable, en dépit de la disparition du fragment correspondant de la *Forma Urbis*.<sup>86</sup> Pourvu de trois *fornice*, avec une arche centrale de plus de 11 m de large, il comptait, avec ses 26 m de façade, parmi les portes monumentales les plus puissantes de Rome. Sa seule présence exprime l'importance accordée par Hadrien au complexe grandiose qu'il avait établi à l'est et au nord des thermes d'Agrippa.<sup>87</sup> Reprenant à son compte le projet de forum conçu jadis par Agrippa, précisément, pour Auguste, avec basilique et temple,<sup>88</sup> Hadrien l'a sublimé avec les moyens et le génie propres de son temps (fig. 5).

Il est temps de conclure. Au terme de cet itinéraire sinueux, qui s'est efforcé de suivre les transformations successives de la notion de basilique derrière l'immuable *basilica*, nous aurons peut-être au moins appris que l'un des caractères les plus déconcertants de l'architecture publique romaine tient au fait que la terminologie n'évolue pas au même rythme que les formes, et que celles-ci ne reproduisent pas toujours la modification des fonctions. La diversité des usages et les ruptures introduites dans le 'design' d'un monument comme la *basilica forensis* et ses succédanés ne sont cependant pas dues aux transformations convulsives d'un espace urbain en perpétuelle évolution, ni la permanence du nom de l'édifice à on ne sait quelle inadéquation du vocabulaire technique latin aux réalités qu'il est censé exprimer. Si, en dépit de ses variantes morphologiques et de son introduction dans des contextes apparemment étrangers à sa finalité première, la basilique est restée telle dans la toponymie et la topographie officielles mais aussi, sans aucun doute, dans la conscience de ses utilisateurs, c'est parce qu'au cours des siècles impériaux les monuments et les espaces qui se sont successivement arrogé les prérogatives réservées en principe au forum



par voie de conséquence les formes d'allégeance imposées au peuple, n'ont pas procédé par accumulation ou juxtaposition, mais par une série de substitutions fonctionnelles et formelles dont les avatars des *basilicae* nous conservent la trace.<sup>89</sup>

#### NOTES

- <sup>1</sup> Ungaro 2001, 76.
- <sup>2</sup> La synthèse la plus récente, celle de Nünnerich-Asmus 1994, ne prend en considération que les basiliques de forum de la fin de la République et du début de l'Empire.
- <sup>3</sup> Ammien Marcellin, *Histoire*, XV, 7, 3 (sur la foi d'une mauvaise lecture de l'inscription dédicatoire, cet auteur attribue le nymphée, qu'il appelle *Septemzodium*, à Marc-Aurèle). Voir aussi XXVIII, 4, 29.
- <sup>4</sup> La définition théorique nous est donnée par Vitruve, *De architectura*, V, 1, 4-6. Voir le commentaire de A. Corso dans *Vitruvio* I, 619-642. Les meilleures illustrations archéologiques sont fournies par les basiliques du Forum de Rome, la basilique de Cosa ou celle de Pompéi. Voir Ohr 1991; Brown et al. 1993, 207-208. Pour les édifices romains, voir les rubriques correspondantes du *LTUR*, 167-170 et 177-180.
- <sup>5</sup> Cf. Coarelli 1985, 42-46 et 138-140.
- <sup>6</sup> Sur l'ensemble du problème, Gros 2002, 235-240 (à propos des origines et des prototypes).
- <sup>7</sup> V, 1, 4: *Basilicarum loca adiuncta...* Sur le sens de cette expression, Gros 1984a.
- <sup>8</sup> Gaggiotti 1985; 1994.
- <sup>9</sup> V, 1, 5. Contrairement à ce qu'on a dit parfois (par ex. Ohr 1991), cela ne signifie pas que les basiliques étaient faites d'abord pour les commerçants.
- <sup>10</sup> Sur les spectacles (en particulier les jeux gladiatoriens) donnés sur le Forum romain à la fin de la République et encore à l'époque julio-claudienne, Ville 1981, 380-381; Golvin 1988, 45-46; Welch, 1994, 59-60.
- <sup>11</sup> V, 1, 6-10. Vitruve ne manque pas de souligner, au début de sa description prolixe, qu'il présente ce faisant un autre type (*genus*) de basilique. Sur cette question, et sur le sens de ce singulier glissement vers une forme en apparence non canonique, voir Gros 1984a ainsi que Wiegartz 1984.
- <sup>12</sup> Plutarque, *Vie de Caton le Jeune*, V, 1-2 (à propos de la *basilica Porcia*).
- <sup>13</sup> Comme le tribunal des centumvirs à partir du début de l'Empire dans la *basilica Julia*.
- <sup>14</sup> Comme le prouve l'introduction précoce d'une *aedes Augusti* dans la basilique construite par Vitruve à Fano (V, 1, 7). Cf. David 1983.
- <sup>15</sup> VI, 5, 2.
- <sup>16</sup> VI, 5, 2: *quod in domibus eorum saepius et publica consilia et privata iudicia arbitriaque conficiuntur*.
- <sup>17</sup> Servius, *ad Aeneidem commentar.*, I, 698. Cf. Bek 1983.
- <sup>18</sup> Cf. Thébert 1985, 339 sq.; Guidobaldi 1986, 206-209, 218. Nous ne recensons pas ici les nombreuses études qui ont cherché dans ces 'basiliques' privées l'origine des édifices de culte paléo-chrétiens. Citons seulement les articles, utiles pour notre propos, de Luschi 1982 et de Lorenz 2000-2001. Sur la dialectique *loci propria/loci communia*, voir maintenant Zaccaria Ruggiu 1998-1999.
- <sup>19</sup> VI, 5, 1.
- <sup>20</sup> Scaevola 32 (*Digeste*, 32, 1, *de legatis et fideicommissis*), 3.
- <sup>21</sup> Sidoine Apollinaire, *Epist.* II, 2, 8. Cf. Rebuffat 1991, 19.
- <sup>22</sup> VI, 3, 8-9. Cf. Gros 2001, 64-65.

- <sup>23</sup> Voir les études citées *supra* (n. 8).
- <sup>24</sup> Zevi 1991; K. Welch, Explaining the origin of the Roman basilica, à paraître dans *JRA*.
- <sup>25</sup> Sur ce type basilical, voir les études fondatrices de Roth-Congès 1987a; 1987b; Nünnerich-Asmus 1994, 141-142.
- <sup>26</sup> Nünnerich-Asmus 1994, 165-166 (fig. 46), 213-214 (fig. 45).
- <sup>27</sup> Lauter 1979, 436-437.
- <sup>28</sup> Nünnerich-Asmus 1994, 189-196.
- <sup>29</sup> Coarelli 1987, 38-39. Voir aussi Balty 1991, 365-367 et surtout Coarelli 1989, 115-116, p. 118.
- <sup>30</sup> *CIL* XI, 5820.
- <sup>31</sup> Manconi 1982, 183-184.
- <sup>32</sup> P. Ciancio Rossetto, s. v. *Theatrum Marcelli*, in *LTUR*, V, 1999, 34-35.
- <sup>33</sup> *Ibid.* et 319 fig. 19.
- <sup>34</sup> Même si l'on peut contester que Vitruve désigne dans son traité (III, 3, 2) le théâtre de Marcellus par l'expression *theatrum lapideum* (cf. la discussion approfondie de la question par A. Corso in *Vitruvio*, I, 304), il n'en reste pas moins que le théoricien a assisté à l'élaboration de l'édifice. Cf. Gros 1994.
- <sup>35</sup> Flavien Josèphe, *Antiquités Judaïques*, XV, 411-415 et *Bellum Judaicum*, V, 190. Le texte, extraordinairement détaillé, des *Antiquités Judaïques* entre dans des considérations techniques et modulaires (dont plusieurs n'ont pas été bien comprises par les éditeurs et traducteurs) qui supposent l'existence d'une notice ou d'une monographie rédigées avant ou pendant la construction de l'édifice par les architectes d'Hérode. La question est de savoir si ces architectes étaient romains, ou au moins formés à Rome. Sur le 'vitruvianisme' de plusieurs des fondations hérodiennes, voir maintenant Roller 1998, 94 sq. et catalogue sous la rubrique Jerusalem. La romanité des monuments hérodiens n'apparaît pas aussi clairement à B. Burrell et E. Netzer, qui font de l'ouvrage de Roller une recension très critique (*JRA*, 12, 1999, 705-715).
- <sup>36</sup> Netzer 1999, 120-123, fig. 163 et 168, avec toute la bibliographie antérieure. Peu ou pour ainsi dire pas de vestiges ont été retrouvés de ce monument insigne; M.L. Fischer souligne cependant que les chapiteaux augustéens recueillis en Israël, le plus souvent erratiques, témoignent d'une influence directe des ateliers romains (Fischer 1990, 16-17, 18-19).
- <sup>37</sup> Voir sur ce point l'analyse de David 1983.
- <sup>38</sup> Sur la basilique du 'Staatsmarkt' d'Ephèse, Alzinger 1974, 26-37; Fössel-Peschl 1982; Halfmann 2001, 36-38, 99.
- <sup>39</sup> V, 9, 1.
- <sup>40</sup> Comparer V, 9, 2 et V, 1, 2-3.
- <sup>41</sup> *CIL* XI, 5820 (*supra*, n. 30): *podio circumclusit*.
- <sup>42</sup> Voir à ce sujet Gros 1984a.
- <sup>43</sup> Voir sur ce point les remarques très pertinentes de Nünnerich-Asmus 1994, 11-14.
- <sup>44</sup> Trillmich et alii 1993, 278, 279-280, fig. 122. Voir aussi Nünnerich-Asmus 1994, 231-232.
- <sup>45</sup> Trillmich 1993, 113-123.
- <sup>46</sup> V, 1, 7.
- <sup>47</sup> Cf. Gros 1987.
- <sup>48</sup> Sur les statues retrouvées dans la proximité du théâtre de Mérida, Trillmich et alii 1993, 280-284. Des observations du même ordre peuvent être faites sur le site du théâtre de *Carthago Nova* (Cartagena), comme l'ont montré les travaux de Abascal/Ramallo 1997, et de Abascal 2002, particulièrement 34-37.
- <sup>49</sup> Vitruve, V, 9, 1 (à propos de la *porticus post scaenam*).



- <sup>50</sup> Amici 1982; Packer 2001, 144-163.
- <sup>51</sup> Sur ce point voir Gros 2002, 255-259.
- <sup>52</sup> Catal. Régionnn. IX et Pol. Silv., 545.
- <sup>53</sup> Sur la localisation de ces *basilicae*, et particulièrement de celle de Matidia, cf. Rodríguez Almeida 1981, 127-128, fig. 36; 129, pl. XXVII. Sur le revers du médaillon de 120-121, Taliaferro Boatwright 1987, 59 fig. 8.
- <sup>54</sup> Sur ce point Downey 1937 reste utile.
- <sup>55</sup> Sur le Champ de Mars à l'époque d'Hadrien, cf. Taliaferro Boatwright 1987, 33-73.
- <sup>56</sup> Sur ces sanctuaires des Gaules et leurs 'basiliques', voir Leday 1980, 328-329; Fincker/Tassaux 1992, 52-53; van Andringa 2002, 110-112. Voir aussi Dondin-Payre/Raepsaet-Charlier 1999, 283, 439, 442, et Bost/Fabre 2001, 97-102.
- <sup>57</sup> Ben Hassen 1990. Voir aussi, par ex., les mentions de CIL VIII, 12006 (Vazi Sarra, temple d'Esculape).
- <sup>58</sup> Cf. Scherrer 2000, 184; Scherrer 2001, 78; Halfmann 2001, 74-76.
- <sup>59</sup> Voir *supra*, p. 194.
- <sup>60</sup> Dion Cassius, 69, 10, 3.
- <sup>61</sup> SHA, Vita Hadriani, XII, 2: *per idem tempus in honorem Plotinae basilicam apud Nemausum opere mirabili extruxit*.
- <sup>62</sup> Freyberger 1990, 54-56.
- <sup>63</sup> Gros 1984b. Voir aussi maintenant Fiches/Veyrac 1996, 241-268.
- <sup>64</sup> Naumann 1937.
- <sup>65</sup> Sur les inscriptions retrouvées sur ce site, cf. Fiches/Veyrac 1996, 244-245, 256-257, 261-262, 265-266.
- <sup>66</sup> Voir par ex. De Fine Licht 1968, 147-150, 153, n. 22.
- <sup>67</sup> F. Coarelli, s.v. *Basilica Constantiniana* in LTUR, I, 172.
- <sup>68</sup> Voir par ex. les synthèses de Heinz 1983; Yegül 1992; DeLaine 1993.
- <sup>69</sup> Par ex. CIL XII, 4342; VII, 287; AE, 1913, n° 227. On note toutefois que l'expression *basilica thermarum* n'est attestée qu'une seule fois, dans le *Codex Théodosien*, X, 2. Sur la nature et les fonctions de ces salles, voir Yegül 1992, 160-162, 400-404. Sur la question de la relation de la basilique thermale avec la 'Kaisersaal' réservée au culte impérial, *ibid.*, 422-423.
- <sup>70</sup> Reynolds 1994.
- <sup>71</sup> Lucien, *Hippias ou le bain*, 6. Cf. Yegül 1979.
- <sup>72</sup> Cf. M. Piranomonte, s.v. *Thermae Antoninianae*, in LTUR, V, 46, fig. 29.
- <sup>73</sup> Plinie, HN, 36, 102.
- <sup>74</sup> Gros, 1985, 45-62.
- <sup>75</sup> Ward-Perkins 1993, 55-63.
- <sup>76</sup> Dion Cassius, 69, 7, 1.
- <sup>77</sup> Voir sur ce point Wandschneider 1989; Scheithauer 2000, 168.
- <sup>78</sup> SHA. Vita Hadriani, 19, 10: *Romae instauravit Pantheonum, Saepta, basilicam Neptuni*.
- <sup>79</sup> Papyrus Oxyr. 412, 65. Cf. Ghini 1990, 178.
- <sup>80</sup> Cf. L. Cordischi, BA, 1990, 5-6, 14-15.
- <sup>81</sup> L. Cordischi, s.v. *Basilica Neptuni*, in LTUR, I, 182-183. Au moment où cet édifice a été construit, les seuls précédents thermaux exploitables étaient ceux des *Thermae Traiani*. On ne saurait toutefois ignorer l'importance de la prétendue 'aula de Trajan' dans les 'Marchés' situés derrière le Forum de cet Empereur. MacDonald 1982, 86-88.
- <sup>82</sup> Cf. LTUR, I, 411 fig. 100.
- <sup>83</sup> L'étude déjà citée de Taliaferro Boatwright 1987 met bien en évidence le fait que l'action d'Hadrien à Rome sur les *fora* impériaux est en liaison directe avec son œuvre édilitaire sur le Champ de Mars, mais elle ne le crédite pas d'un forum dynastique proprement dit (voir surtout p. 74-82).
- <sup>84</sup> On voit encore nettement le long de la via della Minerva qui borde le flanc est du Panthéon un long mur revêtu de briques et rythmé par des niches rectangulaires; c'est le seul vestige actuellement identifiable de ce portique. Cf. M. P. Guidobaldi, s.v. *Porticus Argonautorum*, in LTUR, IV, Rome, 1999, 118-119.
- <sup>85</sup> De Maria 1988, 299-300 (n° 85).
- <sup>86</sup> Voir maintenant Taliaferro Boatwright 1987, 54-58, fig. 6.
- <sup>87</sup> C'est ce que rend bien la restitution de la partie centrale du Champ de Mars intégrant les éléments conservés de la *Forma Urbis* et les vestiges encore en place (Taliaferro Boatwright 1987, 57 fig. 7).
- <sup>88</sup> Cf. Roddaz 1984, 261-277.
- <sup>89</sup> Nous aurions pu envisager également les 'basiliques' en relation avec des marchés ou des *horrea*, bien que dans ces derniers cas l'aspect purement commercial de l'édifice en modifie la signification et sorte du cadre de notre propos. Cf. De Ruyt 1983; Jouffroy 1986, 124, 191, 300; D. Palombi, s.v. *Basilica Vestilia*, in LTUR, I, 189. Pour la *basilica Vascularia* ou *Argentaria* ou *Vascellaria* du *clivus Argentarius*, voir maintenant Papi 2002.

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# Progetto architettonico e percezione comune in età tardoantica

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## Riassunto

*Tra IV e VI sec. disponiamo di documenti che ci permettono di aprire qualche spiraglio sulla committenza dell'imperatore. Si esaminano cinque casi: 1) la basilica del S. Sepolcro a Gerusalemme; 2) la quercia di Mamre; 3) la nuova basilica di S. Paolo fuori le mura a Roma; 4) una basilica dedicata a Maria Theotokos, la cosiddetta Nea, a Gerusalemme; 5) la basilica Eudossiana sulle rovine del Marneion a Gaza.*

*In tutti i casi esaminati la prima preoccupazione dell'imperatore è il livello di ricchezza dell'edificio. Indicazioni dimensionali di massima possono incontrarsi, ma ultima preoccupazione è la scelta tipologica dell'edificio. La consuetudine sembra delegare la maggior parte delle scelte propriamente architettoniche alla chiesa locale in collaborazione con i funzionari della corte.*

*L'insistenza sulla ricchezza delle architetture si accorda con le indicazioni sulle reazioni e aspettative del pubblico, interessato essenzialmente allo sfarzo degli edifici. Questo non escludeva ovviamente una lettura più colta e sofisticata, che non era però quella più diffusa.*

*Gli indizi fanno dunque ipotizzare una certa autonomia di scelte nell'edilizia religiosa da parte delle comunità locali: si dovrà pensare a un sistema che suddivideva la responsabilità delle decisioni a diversi livelli e che prevedeva una serie di interazioni tra centro e periferia per giungere alle scelte tipologiche e artistiche.*

Quando sono stato invitato a prendere la parola in questo incontro ho detto subito di sì con il cuore per l'interesse del tema e, ancor più, per l'affetto e per la stima per l'amico Herman Geertman (cf. 'Editorial' p. V). Mi ha fatto esitare solo una preoccupazione: affrontare il tema proposto per questa giornata in relazione all'età tardoantica significa andare incontro a oggettive difficoltà. Non si può, infatti, parlare di architettura e di manualistica in età tardoantica secondo lo stesso percorso che si segue per il principato. In età giulio-claudia possiamo confrontare un famoso manuale, anzi, *il* manuale, con una serie di edifici studiati in maniera approfondita. In età tardoantica, invece, semplicemente non possediamo un manuale, mentre lo stato delle conoscenze sull'architettura è molto meno soddisfacente ed è concentrato in maniera disomogenea su alcuni tipi architettonici a preferenza di altri.

Dunque, piuttosto che lavorare su qualche pallida derivazione da manuali più antichi, mi sembra più proficuo un diverso approccio, che faccia leva sugli elementi peculiari per questo periodo. In età tarda, diciamo tra IV e VI sec., disponiamo innanzitutto di alcuni documenti ufficiali provenienti dall'amministrazione centrale, che ci permettono di aprire qualche spiraglio sulla committenza. All'estremo opposto, sul lato dei fruitori, abbiamo indicazioni letterarie che ci danno

qualche idea sulle reazioni e sulle aspettative del pubblico. Sono per lo più giudizi assai generici, ma - proprio per il loro carattere di luogo comune - essi ci chiariscono i parametri in base ai quali veniva percepita l'architettura. I due aspetti del problema non sono così lontani come potrebbero sembrare a prima vista in quanto i due poli della committenza e della fruizione, soprattutto nell'evo antico, non dovevano essere troppo distanti e piuttosto rinviano l'uno all'altro.

Cercherò dunque di partire da quei testi che danno qualche indicazione sulla costruzione di basiliche: esaminerò cinque casi di cui almeno due piuttosto famosi.

Il primo è la lettera dell'imperatore Costantino a Macario, vescovo di Gerusalemme, per la costruzione della basilica del S. Sepolcro (fig. 1). L'imperatore chiarisce innanzitutto il livello di lusso che deve raggiungere l'edificio: sia la basilica che i suoi annessi devono essere 'di gran lunga più splendidi se paragonati ai medesimi edifici esistenti in ogni altro luogo sulla terra: lo scopo che infatti ci proponiamo è che codesta costruzione vinca il confronto con tutti i più begli edifici di ogni altra città'.<sup>1</sup> E più avanti si ribadisce che 'è giusto che il luogo più straordinario e meraviglioso che esista al mondo venga adornato così come esso merita'.<sup>2</sup>



Seguono precise disposizioni amministrative: la costruzione della parte strutturale è affidata alla responsabilità del prefetto del pretorio per l'oriente Draciliano e al governatore della provincia,<sup>3</sup> mentre la fornitura dei marmi e delle colonne è a carico dell'amministrazione centrale, sulla base delle indicazioni che Macario stesso invierà all'imperatore.<sup>4</sup> In chiusura si affronta il problema della copertura, chiedendo al vescovo se 'la copertura della basilica debba essere a cassettoni o di un'altra opera'. È chiaro, però, che le preferenze imperiali sono per la prima possibilità: infatti 'se [la copertura] sarà a cassettoni la si potrà anche rivestire d'oro'.<sup>5</sup> Anche l'oro verrà fornito, come i marmi, dall'imperatore.

In base alla sensibilità architettonica attuale e alle concezioni correnti sull'intervento imperiale nell'edilizia pubblica, il lettore contemporaneo si aspetterebbe indicazioni più precise anche dal punto di vista della tipologia architettonica. Nella lettera, invece, non si trova niente di tutto questo: il progetto è affidato al vescovo (e ovviamente agli esperti di sua fiducia). Si chiarisce infatti che spetta a Macario di 'far conoscere (...) ai funzionari sopra menzionati il numero degli operai e degli artigiani, come pure l'entità delle spese di cui vi è bisogno'.<sup>6</sup>

Per completezza va aggiunto anche un importante dettaglio che si trova nella *Chronographia* di Teofane,<sup>7</sup> redatta agli inizi del IX sec., ma basata per questa parte su un'ottima fonte. All'anno 335, infatti, è ricordato il *floruit* dell'architetto Zenobio 'che eresse il Martyrium a Gerusalemme su comando di Costantino'. La vulgata degli studi associava a questo architetto anche il presbitero costantinopolitano Eustathios, ma il Deichmann<sup>8</sup> ha chiarito come si trattasse di una cattiva lettura della fonte

di Teofane dovuta a un epitomatore che aveva compresso due notizie successive in una sola, confondendole.<sup>9</sup>

Se prendiamo sul serio la lettera imperiale a Macario, però, dobbiamo pensare che Zenobio sia stato inviato solo in un secondo momento, a supporto del vescovo e, benché sia possibile che l'architetto abbia ricevuto ulteriori istruzioni da Costantino, le scelte di impostazione dovettero essere già previste da Macario e dal suo entourage, poiché a lui viene richiesta la stima del numero degli operai, dei materiali e dei fondi necessari.

In sintesi, all'imperatore non interessa molto se la basilica sia a tre o a cinque navate, se abbia un cortile o una cupola. La sua prima preoccupazione è fissare il livello che la ricchezza dell'ornamentazione deve raggiungere: il più elevato possibile poiché si tratta del 'luogo più straordinario e meraviglioso che esista al mondo'. Qui la terminologia non è ancora sufficientemente ecclesiastica, se la confrontiamo con la definizione assai più tecnica - *pro sanctimonio religionis*<sup>10</sup> - utilizzata in un contesto analogo da Valentiniano II, Arcadio e Teodosio per la basilica di S. Paolo a Roma.

I mezzi per raggiungere questo livello elevato sono assai semplici: non si parla di sofisticate architetture, ma di una gran profusione di marmi, di colonne e - possibilmente - di soffitti dorati.

Il secondo testo da esaminare è assai più breve: si tratta ancora di una lettera inviata da Costantino a Macario e ai vescovi della Palestina relativa alla quercia di Mamre,<sup>11</sup> il luogo dove Abramo accolse i tre inviati di Dio,<sup>12</sup> sede di un antico santuario pagano. Sulla base di una segnalazione della suocera Eutropia, l'imperatore dà disposizioni per la 'bonifica' dei culti pagani e per l'erezione di una



Fig. 1. Plastico ricostruttivo della basilica del S. Sepolcro, Museo della Torre di Davide, Gerusalemme (da Biddle).

basilica (fig. 2). L'incaricato della costruzione questa volta è il *comes Acacius*,<sup>13</sup> mentre i vescovi della Palestina e della Fenicia sono incaricati di tracciare il progetto di una basilica 'degnata della Chiesa cattolica e apostolica', ma anche della magnificenza imperiale. La costruzione va eretta su quel luogo 'sia per la sua vetustà che per la sua santità'. Qui il linguaggio si fa già un poco più tecnico ed ecclesiastico, ma le motivazioni, la ripartizione dei compiti e le indicazioni amministrative sono le stesse già viste per la basilica del S. Sepolcro.

Il terzo caso è la basilica di S. Paolo fuori le mura a Roma. Possediamo un rescritto di Valentiniano II, Teodosio I e Arcadio indirizzato al *praefectus urbi* Sallustio,<sup>14</sup> con istruzioni per l'erezione di questa basilica. La datazione esatta del documento è controversa e oscilla tra il 384 e il 386.<sup>15</sup> Inoltre vengono riferite alla stessa basilica due *relationes*<sup>16</sup> e due lettere<sup>17</sup> di Q. Aurelio Simmaco degli stessi anni, che parlano dell'erezione di una *basilica nova* non meglio specificata. In questa sede non c'è spazio per una discussione dettagliata del problema: in estrema sintesi basterà dire che la datazione del rescritto al 386, basata sulla datazione di due costituzioni del Codice Teodosiano indirizzate a Sallustio,<sup>18</sup> va accettata senza ipotizzare errori nella tradizione testuale. Considero infatti risolutivi gli studi di Luis Martinez-Fazio e di Domenico Vera<sup>19</sup> a cui rimando. La conseguenza necessaria è che le *relationes* e le lettere di Simmaco riguardano una *basilica nova* che non ha nulla a che fare con S. Paolo. La posizione tuttora prevalente è, invece, quella di Krautheimer, il quale non aveva accettato questa ricostruzione. Il famoso studioso, però, non aveva tentato una confutazione dell'analisi cronologica e prosopografica dei documenti, ma piuttosto riteneva inverosimile che una basilica cristiana grandiosa come quella di S. Paolo e una seconda basilica (profana o pagana che sia) fossero costruite contemporaneamente a spese dello stato, in un periodo in cui gli interventi imperiali a Roma sono estremamente rari.<sup>20</sup> Rimando a un contributo che ho in preparazione la discussione più dettagliata del problema, ma anticipo qui che, a mio parere, la *basilica nova* è effettivamente una basilica civile e va identificata con la *basilica Piniani*, menzionata da un'iscrizione recentemente pubblicata.<sup>21</sup>

Torniamo ora al rescritto: come è noto la primitiva basilica costantiniana doveva essere di proporzioni assai modeste e orientata in maniera opposta all'attuale,<sup>22</sup> con ingresso cioè dalla via

cazione in forme più grandiose. Si dovettero però tenere presenti due vincoli: da un lato la presenza della tomba dell'apostolo, che non poteva essere mossa e che doveva trovarsi nel punto focale dell'edificio, dall'altro i condizionamenti topografici costituiti dalla via Ostiense con la rupe di S. Paolo a est e, sul lato opposto alle spalle della basilica, dal Tevere con una via secondaria (*iter vetus*), che ne seguiva la riva, e un secondo percorso viario più vicino all'abside (*praesens via*), che dovette essere abolito per dare spazio alla nuova costruzione (fig. 3).<sup>23</sup>

Al di là dei dettagli topografici, il rescritto è interessante per le istruzioni tecniche e amministrative che dà o presuppone, nonché per i motivi della ricostruzione.

Quanto alle procedure si possono riassumere i passi da seguire così come emergono dal rescritto:

- 1 Sallustio aveva già inviato alla corte una relazione sulla situazione del terreno;
- 2 in seguito avrebbe dovuto prendere contatti con il vescovo di Roma, il clero e la comunità cristiana per discutere a fondo la costruzione;
- 3 avrebbe dovuto chiedere l'autorizzazione al *senatus populusque Romanus* per le modifiche della situazione stradale circostante, imposte dall'ampliamento della basilica;
- 4 infine avrebbe dovuto inviare a corte un progetto (*synopsis*) e una valutazione dei costi per l'approvazione.<sup>24</sup>

Quanto alle motivazioni per la ricostruzione, esse sono sintetizzate nelle prime righe in tre brevi frasi: gli imperatori desiderano *pro sanctimonio religionis ornare*, *pro quantitate conventus amplificare*, *pro studio devotionis attollere* la basilica.

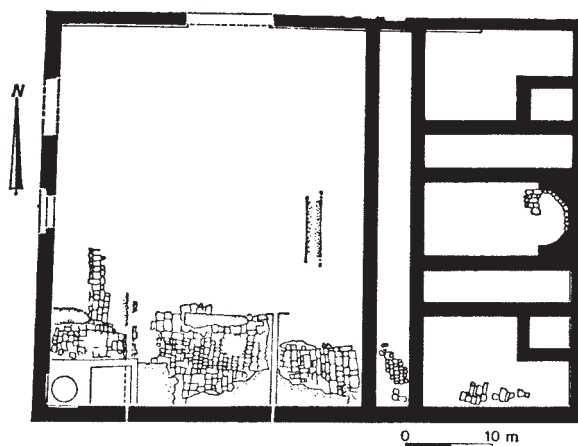


Fig. 2. Pianta della basilica di Mamre (da Murphy-O'Connor).

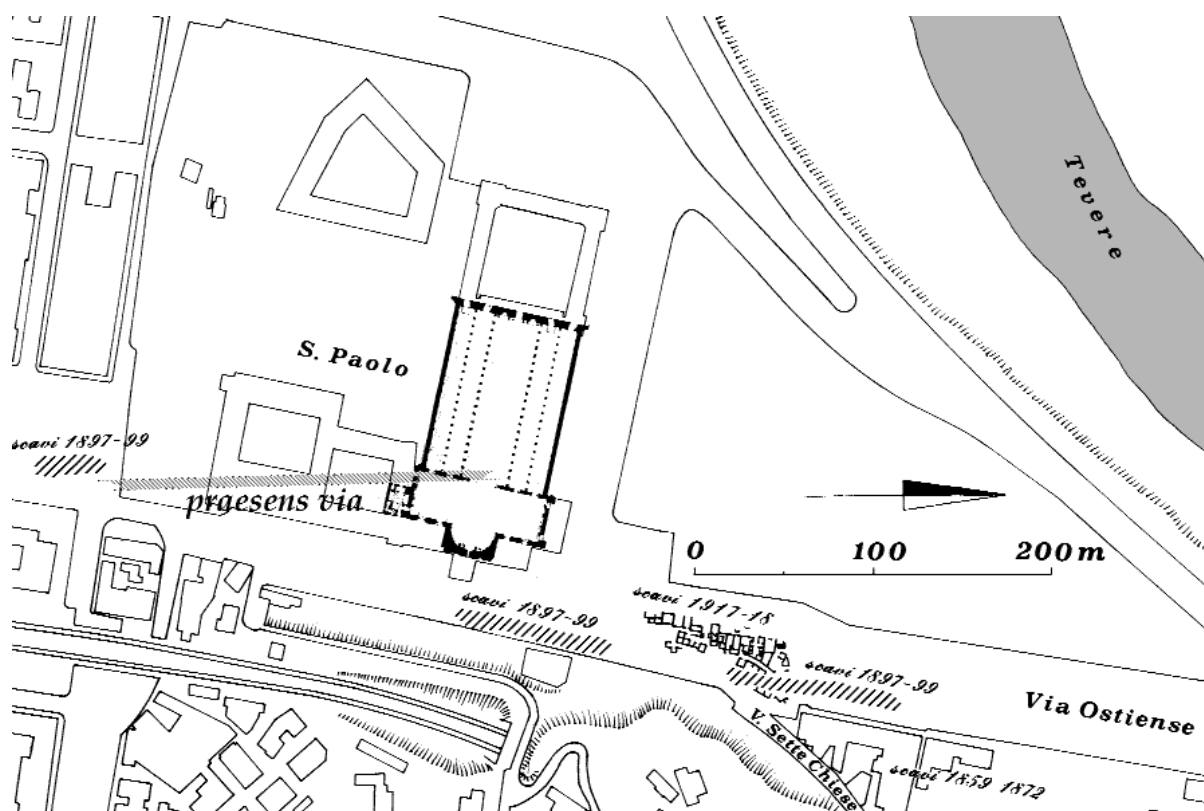


Fig. 3. Pianta dell'area di S. Paolo.

Spesso su queste frasi si sorvola dando per scontato che si tratti di luoghi comuni, con funzione unicamente ornamentale e retorica. È invece necessario prendere sul serio queste indicazioni ed esaminarle più da vicino: la chiesa va decorata per la santità della religione, va ampliata per il numero dei fedeli che vi si raccolgono e va resa più alta per l'ardore della devozione. È opportuno precisare che *attollere* va inteso in senso materiale e non figurato:<sup>25</sup> in questa seconda accezione, infatti, ripeterebbe il concetto già espresso da *ornare*, mentre abbiamo a che fare con indicazioni a modo loro concrete e precise. In altre parole la basilica va resa più ricca, più ampia, più alta, dove *amplificare* allude all'ampliamento planimetrico per il fine pratico di ottenere una maggiore capienza e *attollere* completa il concetto nella terza dimensione, ma per motivi spirituali.

Le disposizioni imperiali, dunque, riguardano l'ampliamento della costruzione e le sue ripercussioni sull'area circostante, ma non parlano di scelte tipologiche. È lecito sospettare che il rescritto imperiale accogliesse richieste della chiesa romana. Infatti, la riedificazione della basilica di S. Paolo dovette nascere sia da esigenze pratiche,<sup>26</sup> dall'i-

nadeguatezza cioè della basilica ad accogliere il gran numero di fedeli, sia dal desiderio di dare all'apostolo Paolo una dignità pari a quella di Pietro anche dal punto di vista liturgico e architettonico. Difficilmente tale esigenza poteva essere nata a Costantinopoli: essa sembra piuttosto fortemente legata alla sensibilità romana. Come è noto, infatti, la seconda basilica di S. Paolo richiama molto da vicino la basilica di S. Pietro in Vaticano (figg. 4-5),<sup>27</sup> con le sue cinque navate e il transetto, un tipo che altrimenti non aveva trovato alcuna imitazione nei circa settant'anni intercorsi tra le due costruzioni. Questa esigenza, forse fatta già presente in maniera più generica alla corte imperiale, dovette essere chiarita in dettaglio nel corso degli incontri che, dopo il rescritto, Sallustio tenne con i rappresentanti della chiesa di Roma e venne quindi recepita nel progetto.

I tre casi appena esaminati in ordine cronologico ci sono noti sulla base di documenti che provengono direttamente dalla cancelleria imperiale. Come si è detto, la possibilità che abbiamo è straordinaria: nella storia dell'architettura antica è rarissimo poter contare su documenti programmatici provenienti direttamente dalla commit-



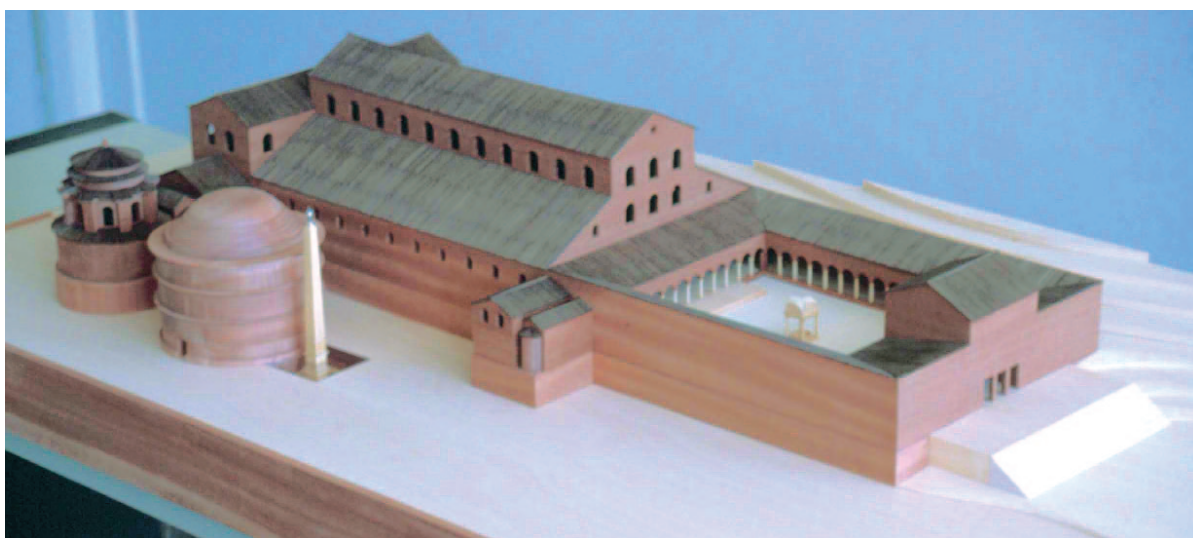


Fig. 4. *Plastico ricostruttivo di S. Pietro nella seconda metà del V sec., Musei Vaticani.*



Fig. 5. *Plastico ricostruttivo di S. Paolo, Musei Vaticani.*

tenza. La norma, invece, è la ricostruzione delle intenzioni a partire dai dati archeologici - con il rischio sempre presente di proiettare sensibilità e problematiche moderne sul monumento antico - o, nel migliore dei casi, a partire da fonti letterarie successive anche di molti anni alla costruzione. In questi casi le reinterpretazioni *a posteriori* si sovrappongono alle intenzioni del progetto, le sostituiscono oppure le filtrano. Questo aspetto forse non è stato sufficientemente sottolineato e implica anche il fatto che gli accenni contenuti nei rescritti e nelle lettere imperiali, per quanto stringati e stereotipati, vanno presi sul serio, in quanto è questa l'interpretazione ufficiale che

l'imperatore e il suo staff volevano venisse attribuita all'opera di cui veniva decisa l'erezione.

I due esempi che seguono rientrano tra i casi che, invece, sono noti attraverso fonti successive, di carattere encomiastico o agiografico. Conviene esaminare per primo il caso testimoniato da fonti più ricche e vicine alla committenza e per ultimo quello in cui i problemi della evoluzione del testo sono più gravi e potenzialmente incidono in modo più pesante sull'attendibilità delle notizie trasmesse.

Il nostro quarto caso, dunque, è la basilica di Gerusalemme dedicata da Giustiniano a Maria Theotokos<sup>28</sup>, la cosiddetta *Nea* (figg. 6-7). Ce ne

parla il *De Aedificiis* (§ 5.6) di Procopio e la Vita di S. Saba di Cirillo di Scitopoli (§§ 72-73). Come si è detto, sono necessarie alcune precauzioni nel considerare tali fonti: in particolare si deve tener conto che le descrizioni di Procopio hanno un intento encomiastico, per cui le iniziative edilizie di Giustiniano figurano come derivanti direttamente dalla volontà dell'imperatore che, nell'ottica dello storico, ne è l'unico e vero autore, mentre agli architetti resta solo una funzione esecutiva. Nei capitoli relativi alle opere più impegnative, infatti, lo schema narrativo di Procopio prevede solitamente che gli architetti si trovino a scontrarsi con difficoltà superiori alle loro forze e che la soluzione venga direttamente da Giustiniano, sostenuto dalla celeste ispirazione.

Secondo Procopio, dunque, è di Giustiniano la decisione di costruire una basilica grandiosa dedicata alla Madre di Dio, nonché la scelta del luogo, ossia la collina più elevata della città.<sup>29</sup> L'altra fonte a nostra disposizione, la Vita di S. Saba, da questo punto di vista ha minori preoccupazioni encomiastiche e sembra anche meglio documentata. La sua versione è alquanto differente: l'imperatore, infatti, su sollecitazione dell'abate Saba fa suo il progetto di Elia, patriarca di Gerusalemme, che aveva già gettato le fondamenta della basilica.<sup>30</sup> Ciò significa che la costruzione era ferma almeno da un quindicennio: la visita di Saba a Giustiniano si colloca infatti nel 530, mentre Elia era stato cacciato dalla sua sede e al suo posto, il 1° settembre del 516, era stato insediato *manu militari* Giovanni. Gli ostacoli che avevano bloccato la costruzione, dunque, non erano solo economici, ma piuttosto politici.

Probabilmente l'intervento imperiale impresso una svolta al progetto: è verosimile che Giustiniano abbia mantenuto la collocazione prevista originariamente dal patriarca Elia, ma si deve pensare che la nuova fabbrica fosse di ricchezza e di dimensioni superiori a quelle che potevano essere previste nei piani originali della chiesa gerosolimitana (fig. 8). Lo fa pensare l'insistenza di Procopio sull'imponenza dei lavori di costruzione, che avrebbero interessato un quarto dell'area destinata alla basilica. Inoltre sembra che l'ospizio per i pellegrini, che pure Giustiniano costruisce su sollecitazione di S. Saba, non fosse nei progetti di Elia,<sup>31</sup> ma sia stato accorpato al complesso della basilica, con un ripensamento e un ampliamento dell'idea originaria.

Sempre dalla Vita di S. Saba<sup>32</sup> apprendiamo importanti dettagli tecnico-amministrativi: l'incarico è affidato all'architetto Teodoro, inviato da Costantinopoli; gli esattori imperiali di Palestina

forniranno i fondi necessari, l'alta amministrazione dell'impresa è delegata all'arcivescovo Pietro, patriarca di Gerusalemme, ma la direzione dei lavori è attribuita a Barachos, vescovo di Bakatha.<sup>33</sup> L'articolazione è abbastanza complessa con responsabilità a più livelli, dove l'architetto sembra avere una funzione strettamente tecnica.

A tale sistema di ripartizione delle responsabilità per l'amministrazione straordinaria della nuova costruzione dovette subentrare successivamente un sistema più ordinario. Lo sterro di una grande cisterna che faceva parte delle costruzioni immediatamente a sud della chiesa (fig. 9), infatti, ha portato in luce un'importante iscrizione che celebra l'opera dell'imperatore.<sup>34</sup> Per 'opera' (*èrgon*) si deve certamente intendere la cisterna, ma evidentemente anche quello che essa sosteneva, probabilmente uno degli edifici annessi al complesso, forse l'ospizio. La vita di Saba specifica che quest'ultimo, inizialmente della capacità di cento letti, avrebbe dovuto in seguito raddoppiare la sua disponibilità di accoglienza.<sup>35</sup> Sempre secondo l'iscrizione, l'opera fu curata da Costantino, presbitero e igumeno, personaggio citato anche da Giovanni Mosco proprio come igumeno della *Nea*.<sup>36</sup> Evidentemente, una volta che la basilica era stata consacrata e affidata alla comunità religiosa



Fig. 6. Mappa di Madaba con evidenziata la Nea nella vignetta di Gerusalemme.

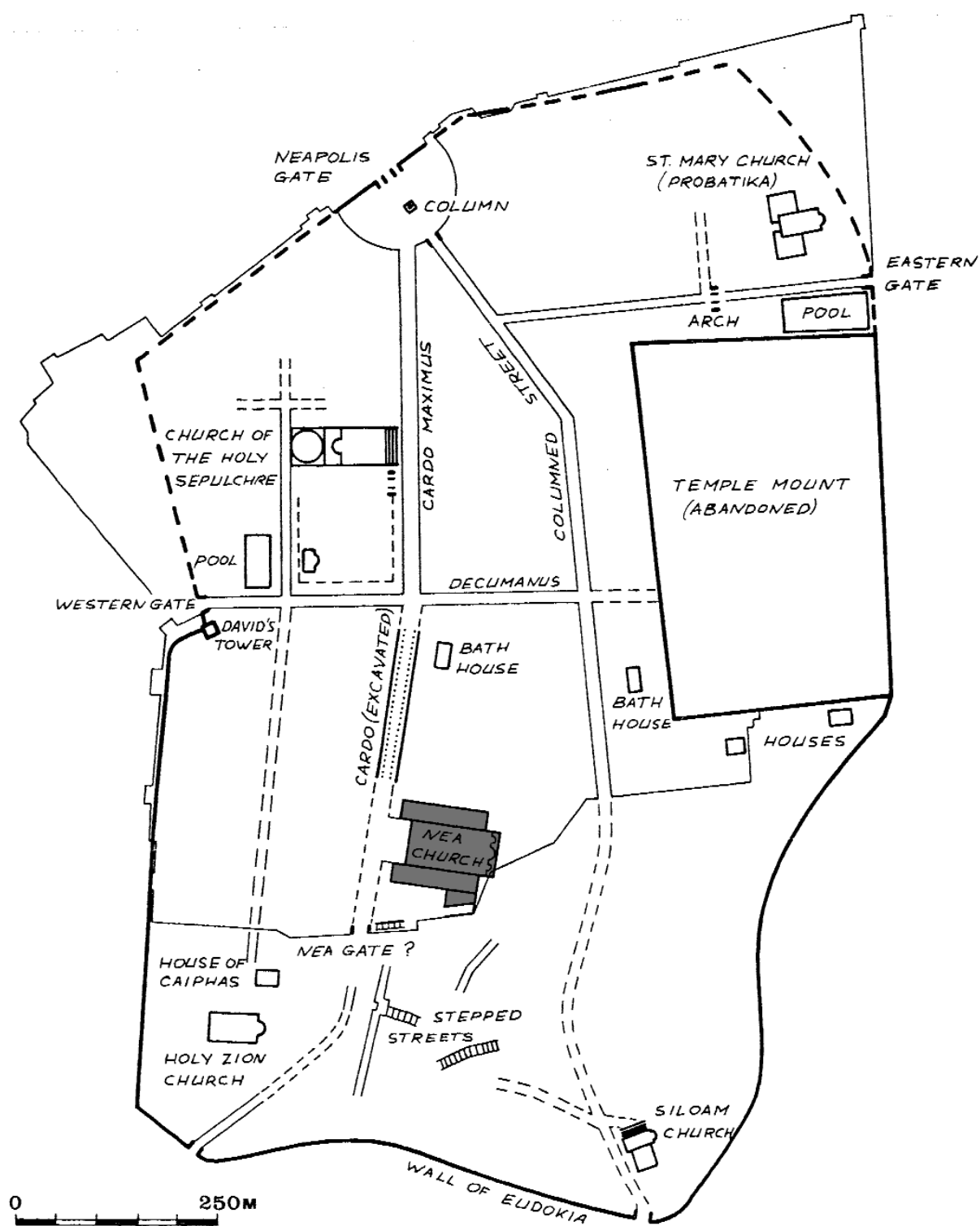


Fig. 7. Pianta di Gerusalemme bizantina con la posizione della Nea (da Avigad).



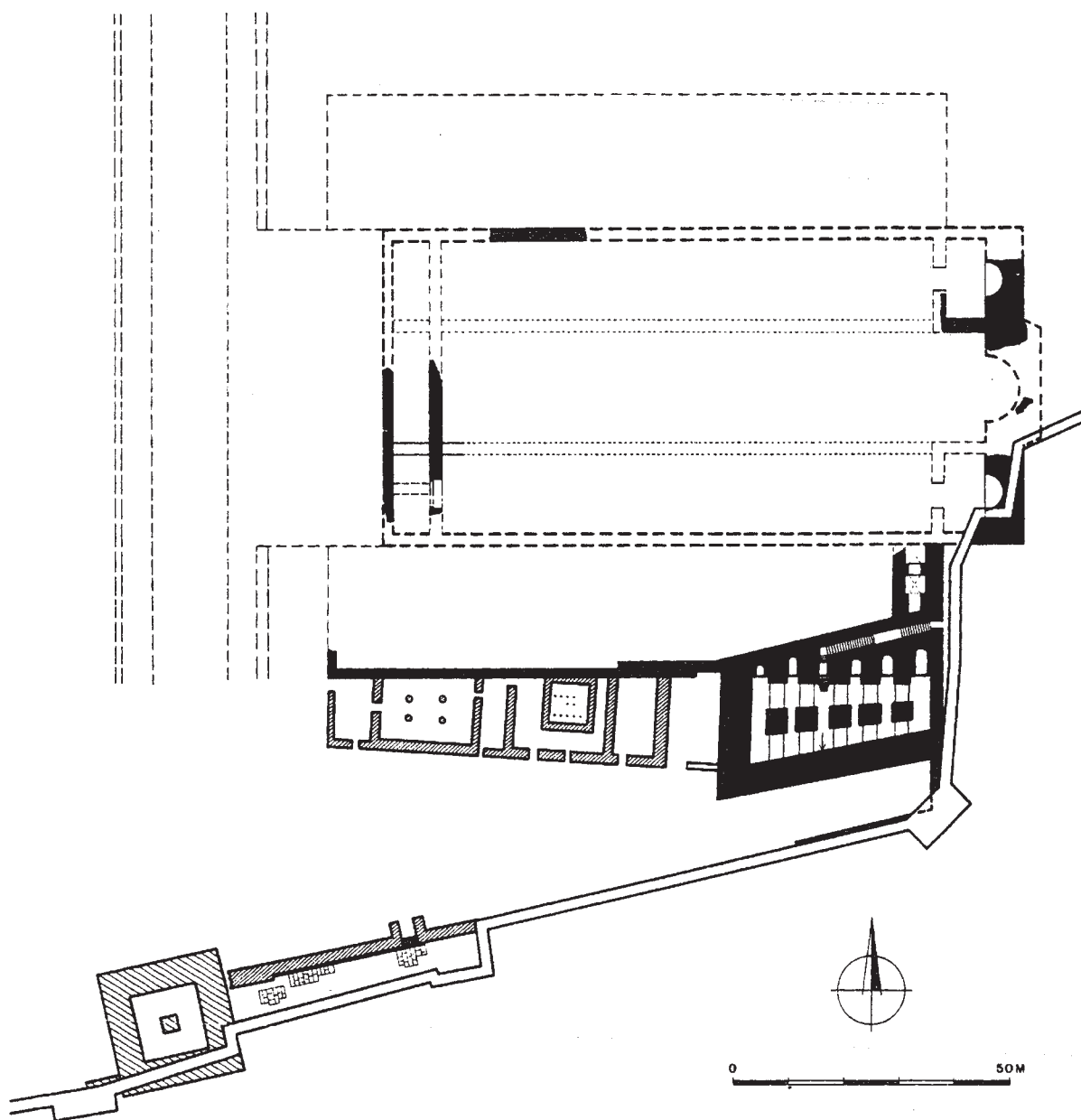


Fig. 8. Pianta della Nea (da Avigad).

che assicurava la celebrazione della liturgia e la gestione amministrativa, gli ulteriori interventi a carattere edilizio - anche se finanziati dall'imperatore - ricadevano nelle competenze del superiore della comunità stessa, che era subentrato alla gestione straordinaria di Barachos.

Cirillo di Scitopoli non vuole descrivere l'ampiezza dell'edificio, 'il suo splendore (...) e la ricchezza della sua decorazione', ma per fortuna lo fa Procopio, anche se in modo non del tutto

chiaro. Quel che qui interessa, però, è che Procopio ci trasmette le istruzioni imperiali: oltre alla collocazione topografica esse riguardano 'che cosa servisse quanto al resto' nonché le dimensioni della pianta dell'edificio.<sup>37</sup> Non è chiaro a che cosa esattamente si riferisca la generica indicazione del 'resto': se presupponga cioè istruzioni più dettagliate sul progetto architettonico o se invece si riferisca a vincoli e a indirizzi generali riguardanti aspetti funzionali dell'edificio ovvero al livello di

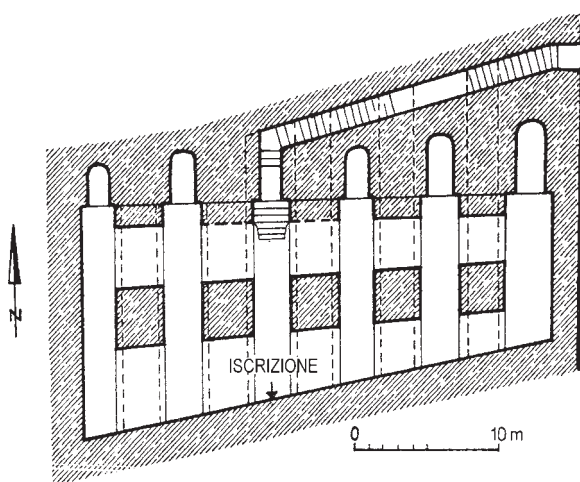


Fig. 9. Pianta della cisterna della Nea (da Avigad).

sfarzo con cui doveva essere realizzata la chiesa. Entrambe queste ultime possibilità appaiono verosimili.

Nel seguito della narrazione di Procopio, come al solito, i costruttori si scontrano contro una serie di ostacoli: lo spazio pianeggiante è insufficiente, tanto che un quarto dell'area interessata dalla basilica va sostruita, la larghezza della navata è tale che ci sono difficoltà di approvvigionamento dei travi necessari per le capriate della copertura, la rete stradale va trasformata per permettere ai carri di portare i blocchi colossali della costruzione, non si trovano colonne abbastanza grandi e resistenti per sopportare il carico del tetto e comunque è difficile importarle da fuori per l'asperità dell'orografia. Di fronte a quest'ultima difficoltà, che è la più grave incontrata, è l'assistenza di Dio all'imperatore che fornisce la soluzione grazie alla scoperta provvidenziale di una cava di pietra nelle vicinanze. Tale provvidenziale scoperta permette di utilizzare colonne anche per le costruzioni accessorie e addirittura di ricavare per l'ingresso quelle che Procopio, verosimilmente con qualche esagerazione, considera le colonne più grandi del mondo. La descrizione delle *stoai* e delle altre costruzioni dello stesso complesso è di difficile comprensione, come spesso avviene in questi casi, visto che la finalità è più letteraria ed encomiastica che tecnica. In ogni caso è chiara la presenza all'ingresso del complesso dell'ospedale per i poveri e del ricovero per i pellegrini.

Esiste un'ulteriore indicazione implicita nel testo di Procopio: le dimensioni, infatti, comportano anche una scelta tipologica di massima. Se infatti si indicano le dimensioni di un'area rettangolare allungata è ovvio che il tipo di edificio

prescelto sarà a pianta basilicale, se si tratta di un'area quadrata, invece, è più facile pensare a una chiesa a pianta centrale, circolare o cruciforme. Grazie agli scavi sappiamo che la prima opzione, la pianta basilicale, è quella effettivamente prescelta. Forse tale indicazione tipologica rientrava nella vaga dizione di Procopio relativa alle cose necessarie 'quanto al resto', ma essa potrebbe risalire anche al precedente progetto del patriarca Elia.

Il livello della decorazione, infine, è chiarito quando Procopio specifica che il santuario dedicato alla Madre di Dio nelle intenzioni dell'imperatore non doveva avere rivali. Tale livello in ogni caso doveva essere specificato fin dall'inizio in quanto aveva a che fare da un lato con le finalità propagandistiche volute da Giustiniano e dall'altro con le previsioni finanziarie.

In sintesi, il tipo di indicazioni non sembra molto diverso da quello già visto in altri casi, in particolare per la basilica di S. Paolo. Nel caso della Nea, l'indicazione dell'altezza non è riferita alla basilica, quanto piuttosto al luogo in cui sorge: l'effetto però è lo stesso e Giustiniano avrebbe probabilmente sottoscritto la formula *pro studio devotionis* utilizzata dai suoi tre predecessori nel rescritto a Sallustio concernente S. Paolo fuori le mura.

In secondo luogo, per quanto è possibile fare affidamento sulla versione di Procopio, sembra che il progetto non fosse arrivato pronto e dettagliato da Costantinopoli, ma piuttosto che l'imperatore si fosse preoccupato di dare indicazioni di massima, lasciando la definizione dei particolari e la soluzione dei problemi, a cui il cantiere andava incontro di volta in volta, ai vescovi incaricati e all'architetto Teodoro, per quanto di rispettiva competenza. È possibile naturalmente che Teodoro fosse in possesso di ulteriori istruzioni più specifiche di quelle che ci sono giunte, ma è meglio non addentrarsi nel campo delle illazioni.

Giungiamo infine al quinto e ultimo esempio da esaminare: quello dell'erezione della basilica Eudossiana, costruita a Gaza sulle rovine del *Marneion*. La nostra fonte in questo caso è la Vita di Porfirio di Gaza, basata su un testo originale di Marco Diacono verosimilmente contemporaneo agli ultimi anni di Porfirio, o comunque non successivo di molto alla sua morte, avvenuta nel 420. La Vita, però, mostra chiari segni di un rimaneggiamento del VI sec. e quindi probabilmente rispecchia più la mentalità di quest'ultimo periodo che quella del secolo precedente, in cui si svolgono i fatti narrati.<sup>38</sup>

Secondo la Vita, l'imperatrice Eudossia, grata a Porfirio della profezia della nascita del figlio Teodosio II, chiede al vescovo di costruire una chiesa nel centro della città (§ 43) dotata anche di un ospizio per i pellegrini (§ 53), come abbiamo visto che sarebbe accaduto anche per la *Nea* di Gerusalemme. A tal fine gli dona un primo finanziamento di due *centenaria* e gli promette altri fondi se necessari (§ 53). Dopo aver distrutto il tempio più importante, il *Marneion*, il vescovo tiene consiglio con il clero e i laici della città per costruire la basilica, ma non riesce a decidere sulla pianta da dare all'edificio, se circolare, come era già il *Marneion*, oppure cruciforme. La Providenza risolve il problema mediante l'arrivo di una lettera di Eudossia con allegata la pianta: la chiesa dev'essere cruciforme e si promette l'invio di colonne e di marmi (§ 75). L'anno successivo, infatti, arriveranno 32 colonne di marmo cipollino, 'splendenti come smeraldi' (§ 84). Porfirio, intanto, inizia i lavori, che procedono sotto la direzione dell'architetto Rufino di Antiochia (§ 78) e terminano 5 anni più tardi. La basilica, che prende il nome dall'imperatrice, viene consacrata nella Pasqua del 407 e il biografo di Porfirio riferisce la fama secondo cui sarebbe stata più grande di tutte le chiese dell'epoca (§ 92). Secondo la Vita, anzi, il santo vescovo sarebbe stato accusato di averla costruita troppo grande per il piccolo numero dei fedeli presenti della città. Porfirio, però, era un ottimista e si giustificava dicendo di confidare che Cristo avrebbe moltiplicato il suo gregge fino a che la chiesa sarebbe addirittura risultata piccola (§ 93).

Questo caso sembra differire da quanto abbiamo visto finora, almeno per la scelta della pianta. Il biografo parla infatti di una pianta che arriva direttamente da Costantinopoli e non viene decisa da Porfirio, come è successo negli altri casi esaminati. A un esame più approfondito, però, questa impressione va almeno in parte corretta. Innanzitutto l'intervento di Eudossia appare alquanto straordinario e imprevisto, in quanto è strumento della volontà divina e sembra quindi configurarsi come un'eccezione piuttosto che come la regola. Senza questo *deus ex epistula*, se così possiamo dire, quando cioè si fosse seguita la procedura normale, sarebbero stati il vescovo e la chiesa locale a fare le scelte progettuali. Inoltre, poiché la discussione verte sull'alternativa tra una pianta circolare e una cruciforme, l'intervento imperiale serve a far pendere la bilancia a favore della seconda possibilità. Dunque potrebbe trattarsi più modestamente di un'indicazione schematica sul tipo di planimetria da scegliere - il che sarebbe già

un'indicazione più precisa che nei casi già visti - e non necessariamente di un progetto completo in tutti i dettagli, che forse è piuttosto compito dell'architetto Rufino.<sup>39</sup>

Possiamo prendere a confronto un passo di Aulo Gellio,<sup>40</sup> in cui un architetto presenta a Cornelio Frontone 'diverse piante di bagni su fogli di pergamena'. Dopo che il committente ha scelto 'una pianta e un'idea del vero', l'architetto fornisce un preventivo di massima. La pianta delle terme sembra dunque abbastanza dettagliata da dare non solo un'idea al cliente, ma anche da permettere il calcolo della spesa occorrente. Al tempo stesso sembra logico supporre che si trattasse di una pianta-tipo, di un progetto, cioè, relativamente generico, che aveva bisogno di essere adattato alle necessità particolari e specifiche del caso. Sul dettaglio della pianta inviata da Eudossia, è dunque opportuno mantenere una certa cautela, anche perché, come si è detto, il testo della biografia ci è giunto attraverso una rielaborazione più tarda e comunque il primo intendimento della Vita è quello di onorare sia il vescovo Porfirio, che l'imperatrice Eudossia.

Altri dettagli descritti dalla narrazione della Vita di Porfirio, invece, rientrano nelle consuetudini così come emergono dai casi precedenti: in particolare la fornitura dei marmi e delle colonne a carico dell'imperatrice e il loro particolare valore e significato. Anche la dichiarazione della grandezza straordinaria della chiesa, forse dettata da campanilismo, è paragonabile alle dichiarazioni di Costantino sulla basilica del Santo Sepolcro o di Procopio sulla *Nea*.

Proviamo a sintetizzare qualche conclusione. Abbiamo cinque esempi di edifici decisi e finanziati dall'imperatore, scaglionati su un arco temporale di circa due secoli. Da essi emerge che la prima preoccupazione dell'imperatore è che l'edificio raggiunga un livello effettivamente imperiale, cioè manifesti una dignità e una ricchezza intonata con il committente. Gli elementi fondamentali per trasmettere questa impressione sono innanzitutto legati al tipo di decorazione: più in particolare devono essere impiegati con grande abbondanza rivestimenti di marmi pregiati e colonne, come si specifica sia a Gerusalemme per il S. Sepolcro e per la *Nea*, che a Gaza per la basilica Eudossiana, ed eventualmente dorature, come nel S. Sepolcro. Le dorature erano infatti il tocco che costituiva il segno del massimo sfarzo, come è facile mostrare elencando i numerosi soffitti dorati citati dalle fonti tardo-antiche.<sup>41</sup>

Le motivazioni dell'intervento imperiale e



dello splendore che deve caratterizzare l'edificio sono la santità e la straordinarietà del luogo, argomenti ripetuti sia per il S. Sepolcro che per la basilica di Mamre. In quest'ultimo caso si dice espressamente che l'edificio dev'essere degno della chiesa e dell'imperatore. Un concetto simile, ma più astrattamente ecclesiastico, si trova nel rescritto indirizzato a Sallustio, che chiarisce che l'ornamentazione della basilica di S. Paolo avviene *pro sanctimonio religionis*.

In secondo luogo l'imperatore si preoccupa di dare indicazioni più o meno precise sulle dimensioni planimetriche: ciò avviene in maniera generica per S. Paolo e più precisamente per la *Nea*. La motivazione delle dimensioni è di carattere pratico per S. Paolo, ma possiamo considerare la stessa motivazione anche a Gaza nella basilica Eudossiana, benché essa sia espressa dal vescovo Porfirio invece che da Eudossia e inoltre venga vista in una prospettiva provvidenziale.

Già Costantino, d'altra parte, avrebbe addirittura promulgato una legge sulla necessità di ampliare 'tanto in larghezza quanto in lunghezza' le chiese,<sup>42</sup> mentre in una sua lettera indirizzata a Eusebio di Cesarea ribadiva lo stesso concetto.<sup>43</sup>

Anche l'altezza talvolta è indicata, sia pure in maniera generica. Essa sarebbe stata comunque determinata dalle dimensioni planimetriche, con le quali doveva avere un rapporto proporzionale, tuttavia le viene attribuito un valore più fortemente simbolico e spirituale rispetto alla dimensione della planimetria. A S. Paolo, infatti, l'aumento nell'altezza dell'edificio è motivato *pro studio devotionis*, mentre l'argomento è implicito nel caso della *Nea*, che deve sorgere nel luogo più elevato della città.

Già in età classica e pagana i templi venivano preferibilmente costruiti in modo da spiccare rispetto al tessuto abitativo circostante,<sup>44</sup> ma in ambito cristiano la cosa è particolarmente esplicita. Costantino, nella legge già citata, avrebbe dato disposizione di 'accrescere in altezza le dimensioni degli oratori'<sup>45</sup> ed Eusebio insiste sull'altezza nella descrizione della basilica dei Ss. Apostoli a Costantinopoli.<sup>46</sup>

Se scendiamo, invece, in epoche più tarde di quelle finora toccate troviamo un caso particolarmente esplicito: secondo Gregorio di Tours, Leone è punito con la cecità da S. Felice perché ha consigliato il re visigoto Alarico II (484-507) di abbassare la chiesa di Narbonne, che ostacolava la vista dal palazzo del re verso la pianura.<sup>47</sup>

In ogni caso sia a Gerusalemme, per la chiesa del S. Sepolcro e della *Nea*, che a Gaza, per la basilica Eudossiana, ritorna la preoccupazione di erigere

una chiesa che non deve avere rivali, deve essere il più grande tra gli edifici simili o della stessa epoca, insomma deve costituire un primato.

Ultima delle preoccupazioni imperiali, infine, risulta la scelta della tipologia dell'edificio, che è implicita o sottintesa nel caso della *Nea*, probabilmente per ragioni di preesistenze, mentre è esplicita solo a Gaza, che è però il caso meno affidabile e che si configura forse come un'eccezione. La consuetudine sembra piuttosto delegare la maggior parte delle scelte propriamente architettoniche alla chiesa locale in collaborazione con i funzionari della corte. Possiamo pensare naturalmente che esistessero forme di controllo centrale, come nel caso della *synopsis* di S. Paolo, che i tre imperatori chiedono di vedere, ma il fatto che essa debba essere inviata assieme alle stime economiche fa pensare che si tratti di un controllo amministrativo, piuttosto che artistico.

Resta ormai poco spazio per considerare il secondo polo attorno al quale avevo intenzione di organizzare il discorso, quello della percezione comune dell'architettura. Il tema meriterebbe una discussione più attenta, tuttavia per un primo inquadramento - e soprattutto in rapporto a quanto ho detto nella prima parte - saranno sufficienti dei brevi cenni.

Nelle fonti tardoantiche, infatti, si trovano spesso descrizioni o apprezzamenti relativi a edifici che ricorrono a stereotipi collaudati e piuttosto uniformi. Questi stereotipi non possono essere frettolosamente liquidati come *topoi* letterari, o per lo meno considerarli come tali non esaurisce la questione. Proprio il loro costante ripetersi è infatti indizio della sensibilità architettonica più diffusa, che si potrebbe definire 'popolare' se non si ritrovasse anche in bocca a esponenti tra i più raffinati della cultura dell'epoca.

Partiamo ancora una volta da Eusebio, il quale, dopo aver riportato la lettera di Costantino al vescovo Macario, passa a descrivere quale fosse effettivamente l'aspetto della basilica del Santo Sepolcro. La massima parte della descrizione è dedicata alla decorazione: dell'edicola posta sul sepolcro di Cristo si ricorda che l'imperatore la 'abbellì per prima con ogni sorta di ornamenti quasi fosse il centro del mondo e adornò con colonne di gran pregio e con sommo sfarzo'.<sup>48</sup> L'unico dettaglio degno di menzione è dunque costituito dalle colonne. Il brano prosegue menzionando il cortile centrale che Costantino pavimentò e circondò 'con una lunga teoria di porticati' evidentemente colonnati.<sup>49</sup> L'interno della basilica era rivestito di lastre di marmi policromi' e l'esterno era così ben realizzato da apparire 'per

nulla inferiore al colpo d'occhio che offre la bellezza del marmo'.<sup>50</sup> Il tetto aveva una copertura di piombo e il soffitto interno era a cassettoni dorati,<sup>51</sup> mentre la rotonda dell'Anastasi era immancabilmente circondata di 12 colonne.<sup>52</sup>

Poco più avanti lo stesso Eusebio parla della Basilica degli Apostoli a Costantinopoli, dove sarebbe stato seppellito l'imperatore. La descrizione è un puzzle per gli storici dell'architettura perché è tutto quanto ci rimane dell'importantissima basilica e d'altronde il vescovo di Cesarea non sembra particolarmente portato per far comprendere la disposizione spaziale delle strutture di cui parla. Tuttavia una cosa è chiara: l'imperatore 'la rivestì di marmo da cima a fondo, ricoprendo d'oro tutto il soffitto, che fece dividere in cassettoni finemente lavorati; al di sopra del soffitto il tetto, invece delle tegole di terracotta, presentava una copertura in bronzo' dorato che si vedeva da lontano.<sup>53</sup>

In epoca di poco successiva, quando Rufino tratta del tempio di Serapide ad Alessandria, descrive il complesso circostante, ma dell'edificio di culto vero e proprio dice solo che era 'fornito di colonne preziose, con pareti coperte all'esterno di lastre di marmo larghe e stupende'.<sup>54</sup>

Una chiara espressione di questo stesso concetto si trova in Paolino di Nola quando decanta la nuova basilica di S. Felice: 'che prima poggiava su pilastri in muratura, ora, sostenuta da colonne, ha messo da parte le rozze pietre mutandole col marmo'.<sup>55</sup>

Le osservazioni appena esposte valgono anche in negativo: esiste una corrente critica del lusso impiegato nelle costruzioni. Quando papa Damaso deve esaltare la basilica di S. Agnese, che non poteva rivaleggiare con lo splendore dei maggiori templi pagani ancora visibili a Roma, deve affermare polemicamente che la basilica della santa non li supera per la grandezza o per i tetti dorati, ma perché vi viene celebrato il nome di Cristo.<sup>56</sup> Simile è l'argomentazione di S. Girolamo<sup>57</sup> quando, nell'epistola al presbitero *Nepotianus*, se la prende con quelli che costruiscono chiese troppo sfarzose dalle pareti ricoperte di marmi e dai soffitti dorati. Anche S. Giovanni Crisostomo nelle sue omelie stigmatizza i lussi straordinari e gli sprechi di chi costruisce edifici 'con colonne e pietre di gran valore' e poi neanche li utilizza,<sup>58</sup> oppure se deve presentare una casa inutilmente sfarzosa, la descrive 'decorata con colonne, marmi, portici, ambulacri' ed eventualmente con soffitti dorati.<sup>59</sup> In ogni caso Cristo non decide di entrare in una casa per il fatto che questa ha il soffitto e le colonne dorate.<sup>60</sup>

Allontanandosi dall'ambito privato, Crisostomo dichiara in un'omelia la sua ammirazione per Roma a causa delle due colonne di quella chiesa, Pietro e Paolo, piuttosto che per aspetti esteriori quali l'abbondanza di oro, di colonne e del restante fasto.<sup>61</sup> Le colonne spirituali della chiesa di Roma vengono contrapposte ai sostegni fisici dei suoi edifici. È evidente, però, che in realtà erano questi ultimi gli elementi che - nella percezione comune - risultavano significativi. A riprova di ciò si può citare un'omelia agli Antiocheni ai quali lo stesso vescovo elenca gli elementi in base ai quali si manifesta la grandezza di una città. Egli ancora una volta contrappone la virtù e la pietà degli abitanti agli aspetti esteriori: la magnificenza degli edifici, le molte colonne e gli spaziosi portici e viali.<sup>62</sup> Si può riesprimere in maniera radicale il concetto e dire che, per stabilire il livello di una città, bastava contare il numero delle sue colonne.

Se diamo uno sguardo al Codice Teodosiano e a quello di Giustiniano, troviamo innumerevoli provvedimenti a difesa del *decus* delle città, ma poiché il legislatore deve dare una concreta attuabilità e certezza alle misure protezionistiche, le leggi vietano il trasferimento di marmi e colonne al di fuori della città, o comunque si concentrano sulla protezione di tali elementi architettonici, che sono quelli in grado di definire il livello di un centro urbano o di un edificio.<sup>63</sup>

In conclusione è evidente come la percezione più comune dell'architettura valutasse a colpo d'occhio un edificio non tanto in base alla ricercatezza delle soluzioni spaziali, delle volumetrie, dei percorsi, ma - assai più semplicemente - in base al livello del suo sfarzo, al suo *decus* se vogliamo esprimere in termini più dignitosi la stessa idea.

Altrettanto evidente è che, su questo punto, gli imperatori avevano compreso perfettamente il gusto dei loro sudditi e sapevano come far colpo su di loro, o - detto più elegantemente - come manifestare il prestigio imperiale attraverso il linguaggio architettonico. Ciò non significa, ovviamente, che non esistessero intenditori più raffinati e che le commesse imperiali non tenessero conto anche di un livello di progettazione assai più elevato. La prova più eclatante di questo fatto è S. Sofia a Costantinopoli.

Tuttavia le indicazioni relative a basiliche di committenza imperiale tengono conto di questa sensibilità 'quantitativa', che ancora emerge nelle descrizioni di Gregorio di Tours, quando parla delle basiliche della Gallia dandone le dimensioni, il numero delle colonne e quello delle finestre.<sup>64</sup>

Committenza e pubblico, dunque, si intende-

vano piuttosto bene su alcune idee fondamentali relative all'architettura, semplici e alla portata di tutti. Questo ci deve rendere assai cauti nella ricostruzione di programmi ideologici troppo sofisticati nel caso di edifici imperiali, o meglio deve rendere tali ricostruzioni più attente nell'indicare i vari livelli possibili di lettura e nello specificare quali fossero le fasce sociali o i gruppi di individui che costituivano i destinatari dei diversi messaggi, in cui il livello superiore di lettura non potrà comunque non tener conto di quello più semplice e 'popolare'.

Analoga cautela deve nascere dalla considerazione che le scelte architettoniche per noi più interessanti non sembra fossero decise sempre unilateralmente a corte e imposte meccanicamente al livello periferico. Gli indizi che abbiamo esaminato spingono piuttosto verso un'autonomia di scelta piuttosto ampia in questo campo da parte della comunità e dei maggiorenti locali, per lo meno nell'ambito degli edifici di culto. Non abbiamo, che io sappia, fonti che ci diano un'idea altrettanto buona delle procedure relative all'erezione di opere pubbliche civili e quindi sarebbe pericoloso fare generalizzazioni azzardate.

È tuttavia verosimile che si debba ricostruire un sistema piuttosto articolato che suddivideva la responsabilità delle decisioni e che prevedeva una serie di interazioni tra centro e periferia per giungere a quelle scelte tipologiche e artistiche che maggiormente interessano lo storico dell'architettura.<sup>65</sup>

In altre parole anche il messaggio politico e ideologico trasmesso dall'architettura non può essere ricostruito in maniera troppo semplificata, con un committente che dà a distanza istruzioni vincolanti e una popolazione che supinamente recepisce la propaganda imperiale. Si dovrà pensare piuttosto a un sistema di coinvolgimento delle élites periferiche, che contribuivano all'elaborazione del messaggio e riuscivano a farsi ascoltare a corte per quel che riguarda sia le esigenze pratiche che le forme espressive più adatte a livello locale.

#### NOTE

- <sup>1</sup> Eus., *Vita Const.* 3.31.1.
- <sup>2</sup> Eus., *Vita Const.* 3.31.3.
- <sup>3</sup> Eus., *Vita Const.* 3.31.2; cfr. *PLRE* I, Dracilianus, 271.
- <sup>4</sup> Eus., *Vita Const.* 3.31.3.
- <sup>5</sup> Eus., *Vita Const.* 3.32.1.
- <sup>6</sup> Eus., *Vita Const.* 3.32.2.
- <sup>7</sup> Theophan., *Chronogr.* a. 5825, ed. De Boor 1883, 33. Cfr. anche *Chron. miscellaneum*, ed. Brooks, *Corpus Scriptorum Christianorum Orientalium, Scriptores Syri Versio*, s. III, IV.2, 101.
- <sup>8</sup> Deichmann 1989.

<sup>9</sup> L'opinione comune voleva Zenobio come il vero architetto ed Eustathios come colui che avrebbe completato la costruzione della basilica (cfr. per es. F.M. Abel, in H. Leclercq, *DACL* VII.2 (1927), 2312. Krautheimer 1965, 42 aveva invece avanzato con cautela l'ipotesi che Eustathios, in considerazione della sua origine costantinopolitana, fosse l'architetto imperiale e il secondo il supervisore locale. Nessuna delle due teorie è oggi più sostenibile. La confusione è avvenuta assai presto, essa risale già a S. Girolamo, *Chron.* 233n, anno 336 (ed. R. Helm, 1956, GCS 47) - o più probabilmente alle sue fonti. La notizia viene ripresa letteralmente nel V sec. da Prosp. Tyr., *MGH, AA IX*, 452. Curiosamente Deichmann si basa su quest'ultima fonte, senza risalire a Girolamo, ma la sostanza delle sue argomentazioni non cambia.

<sup>10</sup> Cfr. *infra*.

<sup>11</sup> Eus., *Vita Const.* 3.52-53. Bibliografia in Ovadiah 1970, 131-133, n. 135; Ovadiah/Gomez de Silva 1982, 153, n. 41.

<sup>12</sup> Gen. 18.

<sup>13</sup> *Comes* in Palestina tra il 326 e il 330: *PLRE* I, Acacius 4, 6. Su queste due basiliche e su quella di Costantina cfr. Krautheimer 1993.

<sup>14</sup> *Epistulae Imperatorum Pontificum aliorum inde ab a. CCCLXVII usque ad a. DLIII datae Avellanae quae dicitur collectio*, CSEL XXXV, ed. O. Guenther, I, Pragae, Vindobonae, Lipsiae 1895, 46-47, n. 3.

<sup>15</sup> Per la datazione O. Seeck, *Regesten der Kaiser und Päpste für die Jahre 311 bis 476 n. Chr. Vorarbeit zu einer Prosopographie der christlichen Kaiserzeit*, Stuttgart 1919, 93-94; A. Chastagnol, *Sur quelques documents relatifs à la basilique de Saint Paul-hors-les-murs*, in *Mélanges Piganiol* I, Paris 1966, 420-436 (ristampato in *Aspects de l'antiquité tardive*, *Saggi di storia antica* 6, Roma 1994, 309-327); Martinez-Fazio 1972; Krautheimer/Frazer, in Krautheimer/Corbett/Frazer 1977, 111-118.

<sup>16</sup> Symm., *Rel.* 25; *Rel.* 26.

<sup>17</sup> Symm., *Epist.* 4.70.1; *Epist.* 5.76.1-3.

<sup>18</sup> *Cod. Theod.* XIV.1.2; XIV.3.18, datate 11 giugno 386.

<sup>19</sup> Martinez-Fazio 1972; Vera 1978, 45-94.

<sup>20</sup> Così Krautheimer 1980-1982, 207-208; lo stesso autore sorvola invece sul problema in Krautheimer/Corbett/Frazer 1977, 97, 161-162. Martinez-Fazio 1972, 303-309, elenca una serie di basiliche cristiane che furono costruite più o meno durante gli stessi anni, ma tuttavia per nessuna di esse si hanno elementi per ipotizzare una committenza imperiale. Alcune di esse, inoltre, non sembra possano essere definite 'nuove'. A questo riguardo l'autore osserva che il ponte di cui si tratta negli stessi documenti di Simmaco è pure definito 'nuovo', ma che viene identificato con il *pons Probi* (X. Dupré Raventós, *LTUR* IV [1999], s.v. *Pons Probi* 111-112), e dunque si tratterebbe di un rifacimento. L'argomento però è debole in quanto l'identificazione tra il ponte di Probo e quello di Teodosio è solo un'ipotesi, sempre ripetuta nella storia degli studi, ma priva di una conferma definitiva. Inoltre sembra strano che la basilica dedicata all'apostolo Paolo da Costantino (o almeno dai suoi familiari) venisse identificata solo mediante una denominazione così vaga.

<sup>21</sup> G. Alföldy/T. Kruse, in *CIL* VI 40805: [*Salvi*]s [*dd(ominis) nn(ostris)*](?) / [*Theod*]osio et [*Pl*]acido / [*Valentiniano Augg(ustis)*] / [---- *basilicam* Piniani quo[----] / [----] / [*squalore conflect*- ----] / [*Caecina*] Decius [*Acinatus Albinus v(ir) / c(larissimus)*] / [*praefectus*] urbi iterum vice sacra iudicans] / ----; cfr. Liverani 2003.

<sup>22</sup> La basilica, oltre alle opere citate alla nota 15 si veda ora Filippi/de Blaauw 2000; Brandenburg 2002a; Brandenburg 2002b. Ulteriori ricerche sono in corso da parte di Filippi e dello scrivente.



- <sup>23</sup> Le interpretazioni proposte per questo passo sono varie: l'esposizione classica del problema è di Lanciani 1917, più recentemente Corsetti 1981, con bibliografia. Mi attengo alla lettura da me proposta in Liverani 1989. Ultimamente cfr. anche Bertoldi 1998.
- <sup>24</sup> Si osservi di passaggio che, così come dietro a Costantino che scrive a Macario si riconosce un tecnico di lingua latina, dietro ai tre imperatori si riconosce un tecnico di lingua greca, poiché *synopsis*, usato in questo senso, in latino è un hapax. Nella lettera a Macario (3.32.1), invece, si utilizza il termine *λακωναρία*, inesistente in greco, che Eusebio trova nel testo originario latino e non sa tradurre.
- <sup>25</sup> In questo senso, invece, lo intende Chastagnol 1966, 436 (ristampa 1994, 325), che traduce *attollere* come 'rehausser l'éclat'.
- <sup>26</sup> Chiaramente espresse nel rescritto con la frase *pro quantitate conventus amplificare*.
- <sup>27</sup> Le ricostruzioni proposte nelle figg. 4 e 5 sono state realizzate dal prof. Gavinelli del Politecnico di Milano per la mostra *Pietro e Paolo. La storia, il culto, la memoria nei primi secoli* (Roma 2000). La ricostruzione si basa sugli studi di Krautheimer, aggiornati da alcune ipotesi di chi scrive per quanto riguarda gli edifici annessi alla basilica vaticana.
- <sup>28</sup> Sulla chiesa cfr. Abel 1927; Milik 1960-1961; Avigad 1977; Avigad 1980, 229-246; Ovadia/Gomez de Silva 1981, 221-222, n. 24; Bieberstein 1989, 117.
- <sup>29</sup> Proc., *Aed.* 5.6.4.
- <sup>30</sup> Cyr. Skythop., *Vita Sabae* 72.
- <sup>31</sup> Nella *Vita* (*loc. cit.*) la terminologia è scelta con cura: il santo monaco chiede all'imperatore di fondare l'ospizio e invece di edificare e ornare la basilica, di cui esistevano già le fondazioni.
- <sup>32</sup> Cyr. Skythop., *Vita Sabae* 72 (Cotelier, *Mon. Eccl. Gr.* III, 343 ss.)
- <sup>33</sup> Cyr. Skythop., *Vita Sabae* 72.
- <sup>34</sup> Avigad 1977 (=Avigad 1979 = Avigad 1989); SEG XXVII 1977, n. 1015; Figueiras 1989, 1781, fig. 2: Κ(αι) τοῦτο τὸ ἔργον ἐφιλοτιμῆ/σατο ὁ εὐσεβ(ές)τατος ἡμῶν βασιλεὺς Φλ(άουιος) Ἰουστινιανὸς προνοί/α κ(αι) σπουδὴ Κωνσταντίνου / ὁσιωτά(του) πρεσβ(υτέρου) κ(αι) ἡγουμέ(νου) ἰνδ(ικτιῶνος) ιγ' +.
- <sup>35</sup> Cyr. Skythop., *Vita Sabae* 73.
- <sup>36</sup> PG 87, c. 2857.
- <sup>37</sup> Proc., *Aed.* 5.6.4: ἐπέστελλε γὰρ αὐτὸ Ἰουστινιανὸς βασιλεὺς ἐν τῷ προὔχοντι γενέσθαι τῶν λόφων, δηλώσας ὅποιον τὰ τε ἄλλα δεήσει καὶ τὸ εὖρος αὐτῷ καὶ μήκος εἶναι.
- <sup>38</sup> Marcus Diaconus, *Vita Porphyrii episcopi Gazensis*, (ed. H. Grégoire/M.-A. Kugener, Paris 1930). Cfr. van Dan, 1985; Glucker 1987. Nella discussione che segue indico tra parentesi i capitoli della vita da cui sono tratte le informazioni che sunteggio.
- <sup>39</sup> A questi argomenti interni si può aggiungere anche che è difficile formulare un progetto dettagliato e completo senza la conoscenza dei luoghi e delle condizioni concrete in cui tale progetto va realizzato.
- <sup>40</sup> Gell. 19.10.2: *Memini me quondam et Celsinum Iulium Numidam ad Frontonem Cornelium pedes tunc graviter aegrum ire et visere. (...) Adsiscebant fabri aedium complures balneis novis moliendis adhibiti ostendebantque depictas in membranulis varias species balnearum. Ex quibus cum elegisset unam formam speciemque veris, interrogavit, quantus esset pecuniae sumptus ad id totum opus absolvendum, cumque architectus dixisset necessaria videri esse sestertia ferme trecenta, unus ex amicis Frontonis: 'et praeterpropter' inquit 'alia quinquaginta'.*
- <sup>41</sup> Cfr. i casi raccolti in Liverani 2001-2002.
- <sup>42</sup> Eus., *Vita Const.* 2.45.1.
- <sup>43</sup> Eus., *Vita Const.* 2.46.3.
- <sup>44</sup> Vitruv., 1.7.1: *aedibus vero sacris, (...) in excelsissimo loco, unde moenium maxima pars conspiciatur, areae distribuantur.*
- <sup>45</sup> Cfr. *supra*, nota 42.
- <sup>46</sup> Eus., *Vita Const.* 2.58.
- <sup>47</sup> Greg. Tur. *Glor. Mart.* 91 (MGH, SRM I.2, 99); PLRE II, Leo 5, 662-663. Cfr. M. Vieillard-Troiekourov, *Les monuments religieux de la Gaule d'après les œuvres de Grégoire de Tour*, Paris 1976, 189-190, n. 177.
- <sup>48</sup> Eus., *Vita Const.* 3.34.
- <sup>49</sup> Eus., *Vita Const.* 3.35.
- <sup>50</sup> Eus., *Vita Const.* 3.36.1.
- <sup>51</sup> I cassettoni dorati sono attestati anche da Paul. Nol., Ep. 31.6.
- <sup>52</sup> Eus., *Vita Const.* 3.36.2.
- <sup>53</sup> Eus., *Vita Const.* 3.58.
- <sup>54</sup> Rufinus, *Hist. Eccl.* 11.23: *in medio totius spatii aedes erat pretiosius edita columnis et marmoris saxo extrinsecus ample magnificeque constructa.*
- <sup>55</sup> Paul. Nol., *Carm.* 27.393-394: *Quaeque prius pilis stetit, haec modo fulta columnis, / vilia mutato spreuit caementa metallo.* Accetto la traduzione di Ruggiero 1996: *metal-lus* è per es. impiegato nello stesso identico senso di 'marmo' da Teodorico in Cass., *Var.* 3.9.3. In Paolino l'opposizione colonna/pilastro può arrivare a ricoprire un significato spirituale: cfr. *Carm.* 28. 307-309 *Ipse columnas / eriget in nobis Christus veteresque resolvit / obstructae pilas animae.*
- <sup>56</sup> ICUR VIII, 20752: *templu victricis virginis Agnes, / templorum quod vincit opus terrena(que) cuncta / aurea quae rutilant summi fastigi tecti. / Nomen enim Christi celebratur sedibus istis...* Cfr. anche Ferrua 1942, 249.
- <sup>57</sup> Epist. 52.10.1: *Multi aedificant parietes et columnas ecclesiae subtrahunt: marmora nitent, auro splendent lacunaria, gemmis altare distinguitur, et ministrorum Christi nulla electio est.* Cfr. Ep. 130.14.7: *alii aedificant ecclesias, vestiant parietes marmorum crustis, columnarum moles advehant earumque deaurent capita pretiosum ornatum non sentientia.*
- <sup>58</sup> Joh. Chrysost., *In epist. ad Ephes. cap. I homil.* II.4 (PG 62, c. 22): Πολλοὶ (...) κίοσι καὶ λίθοις πολυτίμοις οἰκοδομήματα ἐξαστράπτοντα κατεργάζονται.
- <sup>59</sup> Joh. Chrysost., *In epist. ad Philipp. cap. III homil.* X.3 (PG 62, c. 260): Τί δέ, ὅταν οἰκίας οἰκοδομῶμεν λαμπράς καὶ μεγάλας, καὶ κίοσι καὶ μαρμάρους καὶ στοαῖς καὶ περιπάτοις ταύτας κατακοσμοῦμεν (...); Τί βούλεται καὶ ὁ χρυσοῦς ὄροφος; Lo stesso autore in un passo dell'*Expositio in psalmum XLVIII.8* (PG 55, cc. 510-511) aggiunge ulteriori dettagli alla descrizione ideale della casa sfarzosa, quali capitelli dorati, fontane, giardini, mosaici e tappeti, belle finestre, ma gli elementi fondamentali restano sempre le pareti incrostate di marmi, le grandi colonne e i soffitti dorati: Ὅταν γὰρ εἰσέλθῃς εἰς οἰκίαν τινὸς πλουσίου, καὶ ἴδῃς ἐν τῷ οἴκῳ αὐτοῦ κίονας ὑπεραίροντας τῷ μεγέθει, καὶ χρυσᾶς κεφαλίδας, καὶ μάρμαρα τῷ τοίχῳ προσπεπηγότα, καὶ κρήνας ὀρεοῦσας, καὶ πηγὰς καὶ περιπάτους, καὶ δένδρα τῷ ἀνέμῳ καμπτόμενα, καὶ πάντα ψηφίδων γέμοντα (...), καὶ τάπητας ἐπὶ τοῦ ἐδάφους κεκείμενους(...) Τῆς οἰκίας ἡ περιφάνεια. Μάρμαρα ἔχει ὁ τοίχος. (...) Χρυσοῦς ὁ ὄροφος. (...) Αἱ κεφαλίδες τῶν κιόνων χρυσᾶι. (...) Ὡραῖα εἶδον μάρμαρα. (...) Θαυμασθοὶ οἱ κίονες, θυρίδες καλαί. (...) Πολὺς ὁ χρυσοῦς ἐν τῷ ὀρόφῳ.
- <sup>60</sup> Joh. Chrysost., *Hom. in Matth.* 83.4 (PG 58, c. 751): Καὶ δείκνυσιν ὁ Χριστός· εἰς μὲν γὰρ τὴν τοιαύτην. ἂν ἢ ἐνάρετος ὁ κατοικῶν, οὐκ ἐπαισχύνεται εἰσελθεῖν· εἰς δὲ ἐκείνην, καὶ χρυσοῦν ὄροφον ἔχῃ, οὐδέποτε εἰς-

ελεύσεται. Ὡστε αὕτη μὲν τῶν βασιλείων λαμπροτέρα. τὸν πάντων Δεσπότην δεχομένη· ἐκείνη δὲ, μετὰ τοῦ ὁρόφου τοῦ χρυσοῦ καὶ τῶν κιόνων, ἀμάραις καὶ ὀχετοῖς ἔοικεν ἀκαθάρτοις, σκεῦη τοῦ διαβόλου ἔχουσα.

- <sup>61</sup> Joh. Chrysost., *Hom. XXXII.2 in epist. ad Rom.* 16.24 (PG 60, c. 678): Διὰ ταῦτα θαυμάζω τὴν πόλιν. οὐ διὰ τὸν χρυσὸν τὸν πολὺν, οὐ διὰ τοὺς κίονας, οὐ διὰ τὴν ἄλλην φαντασίαν, ἀλλὰ διὰ τοὺς στύλους τῆς Ἐκκλησίας τοῦτους.
- <sup>62</sup> Joh. Chrysost., *Hom. ad pop. Antioch.* 17.2 (PG 49, c. 176): Μάθε τί ποτὲ ἐστὶ τῆς πόλεως ἀξίωμα (...). Οὐ τὸ μητροπολὶν εἶναι, οὐδὲ τὸ μέγεθος ἔχειν καὶ κάλλος οἰκοδομημάτων, οὐδὲ τὸ πολλοὺς κίονας, καὶ στοὰς εὐρέας καὶ περιπάτους, οὐδὲ τὸ πρὸ τῶν ἄλλων ἀναγορεύεσθαι πόλεων, ἀλλ' ἡ τῶν ἐνοικούντων ἀρετὴ καὶ εὐσέβεια, τοῦτο καὶ ἀξίωμα καὶ κόσμος καὶ ἀσφάλεια πόλεως.
- <sup>63</sup> Cfr. per es. *CJ* 8.10.6 pr (321 d.C.); 8.10.6.1 (321); *CTh* 15.1.14 (365 d.C.); 15.1.16 (365); 15.1.19 (376); 15.1.37 pr (398).
- <sup>64</sup> Greg. Tour., *Hist. Fr.* 2.14; 2.16.
- <sup>65</sup> In un ambito come questo, dove ogni generalizzazione rigida è sospetta, non si può escludere dunque che in alcuni progetti l'imperatore fosse più presente. Questo è facilmente ipotizzabile per cantieri che si svolgevano anche materialmente a poca distanza dalla corte: è per esempio il caso già citato di S. Sofia. F. Guidobaldi, *Architettura come codice di trasmissione dell'immagine dell'imperatore, dai Severi all'età costantiniana*, *ActaAArtHist* 15, 2001, 13-25 ipotizza un interesse imperiale diretto anche per le basiliche costantiniane del Laterano e di S. Pietro in Vaticano. La documentazione disponibile, però, non permette di pensare che tale fosse la regola più seguita.

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## Sul mito di Sibari

Pier Giovanni Guzzo

Marianne Kleibrink ha pubblicato un lungo e denso studio sulla ricerca archeologica a Sibari e nel suo comprensorio:<sup>1</sup> passata in rassegna la più antica storia della ricerca del sito di Sibari, si analizzano metodi e risultati di quella più recente; si criticano, successivamente, i modelli interpretativi finora proposti e seguiti nell'analisi dell'evidenza, archeologica e topografica, finora recuperata, allargandone il raggio fino a Taranto e a Pithecusa. I materiali ceramici recuperati a Sibari e lungo la costa ionica vengono messi a confronto con la ricostruzione delle attività antiche investigate dall'A. a Francavilla Marittima. Le conclusioni portano a ritenere che solamente dopo la metà del VII secolo il dominio degli Achei si sia diffuso sulla costa ionica d'Italia; in precedenza, i rapporti fra Greci ed Indigeni erano stati molto più equilibrati, permettendo ai secondi di mantenere quasi inalterati i propri costumi.

Il filo del ragionamento dell'A. si dipana con chiarezza e con coerenza: esso parte dal presupposto che le fonti letterarie antiche siano partigiane, e quindi affatto fededegne. Mentre l'evidenza archeologica non può, sempre secondo l'A., mentire nella sua materialità di muto testimone.

Dobbiamo essere grati a Marianne Kleibrink per questo suo studio. Il suo svolgersi ci aiuta a comprendere la difficoltà di passare dall'applicazione di una rigorosa tecnica di scavo e di una registrazione minuziosa di quanto si è osservato, raccolto e distrutto durante il susseguirsi delle scoperte all'interpretazione storica della situazione evidenziata.

Di frequente, il *topos* utilizzato per mettere in guardia da facili entusiasmi e da avventate fughe in avanti nell'interpretazione è costituito dall'*argumentum ex silentio*. Marianne Kleibrink ha a disposizione, come tendenzialmente completo per quanto limitatamente alla sommità della collina che costituisce il sito, solamente il proprio scavo di Francavilla; di Sibari si è iniziato a scavare un centesimo della sua originaria estensione, e per di più parzialmente in direzione verticale; analoghe percentuali di rapporto tra conoscibile e scavato valgono per tutti gli altri luoghi antichi qui trattati.

L'*argumentum ex silentio* ha valore, ovviamente, per tutti gli interpreti, già sperimentatisi nell'agone

oppure ancora potenziali. Così che anche le ricostruzioni basate su un'aderenza alle fonti letterarie antiche potrebbero essere considerate di fantasia, oppure almeno insicure.

Circa l'argomento principale dello studio, è da notare che l'A. non propone un motivo che abbia causato il mutamento dei rapporti di forza che ella data intorno alla metà del VII secolo: almeno per quanto si è riuscito a comprendere dal suo testo.

Una pacifica convivenza, dalla quale evidentemente i protagonisti ricavano la soddisfazione delle proprie esigenze, viene, all'improvviso, a mutarsi nel dominio degli uni sugli altri. Si potrebbe ipotizzare, sempre però sulla scorta delle fonti letterarie antiche, che la guerra degli Achei contro Siris, che dovrebbe situarsi intorno alla metà del VI secolo, possa aver reso coscienti i coloni achei della propria potenza. E che, quindi, essi, anziché smobilizzare dopo l'asservimento dei Colofoni e la distruzione della loro città, si siano rivolti a conquistare anche i comprensori indigeni, con i quali finallora avevano così pacificamente convissuto.

Pur nel rifiuto di seguire le fonti letterarie antiche, Marianne Kleibrink si sarebbe dovuta misurare con questa tradizione: se non altro solo per il fatto che essa si situa cronologicamente in contiguità con il periodo che l'A. indica, su base rigidamente archeologica, come quello di modifica della precedente situazione di convivenza. Salvo errore, si coglie solamente una menzione di quella fonte (p. 43), utilizzata però per giustificare le difficoltà di inquadramento dell'evidenza archeologica nota nel comprensorio dell'attuale Policoro.

Si può ricordare che le fonti letterarie antiche sono larghe di registrazioni a proposito delle modalità di approccio tra Greci ed Indigeni proprio nella fase del primo stanziamento dei primi nei territori occupati dai secondi. E che non mancano informazioni circa lo stato di asservimento degli Indigeni, utilizzati per lo più a vantaggio dei nuovi arrivati in lavori agricoli.<sup>2</sup>

Di certo, ambedue queste categorie di informazione possono essere tacciate di partigianeria; e, in specie la seconda, può essere considerata debole in quanto non oggettivamente situabile nel tempo, tanto da poter essere addirittura valutata come supporto per l'interpretazione recenziore dell'A.



Se l'analisi interna dell'evidenza archeologica non si presta, a quanto si crede di conoscere, a dubbi d'interpretazione che portino a conclusioni cronologiche diverse da quelle difese da Marianne Kleibrink, occorre tuttavia prestare attenzione a qualche ulteriore particolare.

In generale, non si è dettagliatamente informati sulla consistenza numerica delle spedizioni coloniali di quella che l'interpretazione storica tradizionale ritiene la prima generazione: per intenderci, entro l'VIII secolo. Si ritiene, per lo più, che non fossero in molti quelli che, per primi, tentarono il viaggio al di là dello Ionio: così come tramanda Erodoto a proposito delle spedizioni che fonderanno Thera e Cirene.<sup>3</sup> Di fronte a questo *argumentum ex silentio* poco valgono i richiami all'esiguità numerica dei Normanni, ad esempio: per quanto anch'essi abbiano dominato e lasciato il segno di sé. Ma, nonostante l'oggettiva rivalutazione del livello tecnologico posseduto dagli Indigeni, non sembra lecito dubitare che quello posseduto dai greci di VIII secolo era a quello superiore: se non altro a giudicare dalla padronanza nell'arte della navigazione e dal possesso della tecnica scrittoria.

Su un livello teorico, quindi, la predominanza organizzativa supera lo sfavorevole rapporto quantitativo: in specie se l'imposizione di un tale 'dominio' è alternata ad azioni belliche, ancorché queste ultime siano menzionate solamente nelle fonti letterarie antiche.

Ancora, sembra opportuno riflettere sulle modalità di sviluppo dell'economia delle colonie greche arcaiche: a prescindere dal numero della loro popolazione d'impianto. Anche se la quantità di quest'ultima è fattore essenziale per la messa a frutto di qualsiasi attività, dal cui rendimento alimentare la crescita complessiva di quel gruppo sociale. E' da ricostruire che tra le principali attività produttive delle colonie fosse quella agricola: anche per questo argomento, purtroppo, occorre far riferimento quasi esclusivo alle fonti letterarie antiche. Pur con questa limitazione si può valutare che le colture essenziali per l'alimentazione di base (cereali, ortaggi) fossero all'inizio destinate all'autosostentamento. Di altra natura sono le colture dalle quali ricavare, anche, un reddito: fra queste è da considerarsi l'olivicultura. Ma una piantagione di ulivi richiede una 'stazione d'impianto (che)... va dai 5 ai 12 anni' e solo tra il 35° ed il 45° anno 'la pianta entra nella fase di maturità', di durata poi anche secolare, con 'produzione media di litri 1-1,5 di olio per pianta'.<sup>4</sup>

E già Plinio:<sup>5</sup> *'Hesiodus quoque, in primis culturam agrorum docendam arbitratus vitam, negavit*

*oleae satorem fructum ex ea percepisse quemquam: tam tarda tunc reserat.'* Con un'interessante, visto il nostro argomento e la sua collocazione cronologica, citazione da Esiodo. Che gli estimatori esclusivi della documentazione archeologica vorranno temperare con la citazione sopra riportata di un contemporaneo manuale.

L'impianto di un oliveto richiede manodopera in buon numero, ed attrezzi ed accessori non meno numerosi, e ancora impianti per la produzione e la conservazione dell'olio, così come testimonia Catone:<sup>6</sup> se ne deduce che tale attività può avvenire solamente quando si hanno già a disposizione sufficienti risorse da investire.

Appare, quindi, anche solamente da questo esempio che i tempi di sviluppo dei primi nuclei di coloni non possono essere stati tanto rapidi dal momento del loro originario impianto. E, pertanto, la sola documentazione archeologica, per lo più lacunosa così come risulta alla ricerca contemporanea, non è da sola certamente in grado di farci percepire con precisione il momento nel quale si esplica il dominio dei Greci sugli Indigeni. Ma una tale conclusione è ben diversa dall'abbassare cronologicamente l'inizio di tale rapporto di dominio.

Infine, per quanto riguarda un dettaglio della documentazione archeologica disponibile, Marianne Kleibrink intende come testimonianze di capanne le trincee piene di sabbia, da interpretarsi come trincee di fondazione di edifici successivamente smantellati i cui materiali sono stati completamente asportati, note nel cantiere degli Stombi (p. 55), assegnandole, sembra, a frequentazione indigena. Dalle misurazioni riportate nelle relazioni preliminari di scavo, si ricavano lunghezze fino a circa 18 metri<sup>7</sup> e larghezze fino a circa 8 metri.<sup>8</sup>

Non è certo giustificato chiudere questa breve nota rifiutando in toto la nuova, e sorprendente, interpretazione di Marianne Kleibrink: occorre, invece, come premesso, esserle grati per averci costretto ad analizzare schemi interpretativi entrati, pacificamente, nell'uso per verificarne l'affidabilità. Ma l'analisi delle posizioni tradizionali e di questa appena proposta non può non porle a vicendevole confronto: per saggiarne argomentazioni a favore e contro.

A quanto sembra, gli argomenti archeologici avanzati dall'A. ammettono inquadramenti convincenti nello schema tradizionale. In quanto che storiografia ed archeologia portano a noi ognuna una parte della possibilità di conoscenza: la quale si riferisce ad una realtà unica e conclusa, come sono i fatti accaduti in passato. Fra le due categorie di conoscenza possibile non può esserci con-

traddizione<sup>9</sup> sostanziale, anche se c'è differenza di sostanza, e quindi di apparenza ai nostri sensi intellettivi: il che porta a possibilità interpretative diverse da parte di noi moderni. Nel nostro campo di studi non si può tralasciare l'una, preferendole in assoluto l'altra. L'intelligenza dell'interprete si deve appuntare ad intenderle armonicamente ambedue: nell'esempio qui discusso, la scarsità (per quanto oggi si conosce) dell'evidenza archeologica è il segno materiale del progressivo crescere, rispetto ai propri modesti inizi, della presenza greca in Italia Meridionale. Crescita progressiva che le fonti letterarie antiche hanno rappresentato in sordina, rendendola come evanescente, rivolte come sono a magnificare la potenza, ormai raggiunta nella fase nella quale furono composte, delle nuove realtà politiche della Grecia d'occidente.

#### NOTE

- <sup>1</sup> The Search for Sybaris: an Evaluation of Historical and Archaeological Evidence, *BABesch* 76, 2001, 33-70.
- <sup>2</sup> E. Lepore, Geografia del modo di produzione schiavistico e modi residui in Italia meridionale, in A. Giardina/A. Schiavone (edd.) *Società romana e produzione schiavistica* 1. *L'Italia: insediamenti e forme economiche*, Roma/Bari 1981, 79-85, spec. 81.
- <sup>3</sup> Hdt. 4, 148, 153, 156.
- <sup>4</sup> G. Tassinari, *Manuale dell'agronomo*, 5a edizione a cura di B. C. Fischetti, Roma 1991, 815-816.
- <sup>5</sup> N. H. 15, 1.
- <sup>6</sup> *De agricultura*, 10.
- <sup>7</sup> Sibari III, *NSc* suppl. 1972, fig. 3: edificio g.
- <sup>8</sup> Sibari IV, *NSc* suppl. 1974, 30.
- <sup>9</sup> Come invece premette l'A. al proprio studio: p. 33.

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